

# THE OBAMA ADMINISTRATION'S CLIMATE CHANGE POLICIES AND ACTIVITIES

---

## HEARING BEFORE THE SUBCOMMITTEE ON ENERGY AND POWER OF THE COMMITTEE ON ENERGY AND COMMERCE HOUSE OF REPRESENTATIVES ONE HUNDRED THIRTEENTH CONGRESS FIRST SESSION

SEPTEMBER 18, 2013

**Serial No. 113-82**



Printed for the use of the Committee on Energy and Commerce  
*energycommerce.house.gov*

U.S. GOVERNMENT PRINTING OFFICE

87-109 PDF

WASHINGTON : 2014

---

For sale by the Superintendent of Documents, U.S. Government Printing Office  
Internet: bookstore.gpo.gov Phone: toll free (866) 512-1800; DC area (202) 512-1800  
Fax: (202) 512-2104 Mail: Stop IDCC, Washington, DC 20402-0001

## COMMITTEE ON ENERGY AND COMMERCE

FRED UPTON, Michigan

*Chairman*

RALPH M. HALL, Texas	HENRY A. WAXMAN, California
JOE BARTON, Texas	<i>Ranking Member</i>
<i>Chairman Emeritus</i>	JOHN D. DINGELL, Michigan
ED WHITFIELD, Kentucky	FRANK PALLONE, Jr., New Jersey
JOHN SHIMKUS, Illinois	BOBBY L. RUSH, Illinois
JOSEPH R. PITTS, Pennsylvania	ANNA G. ESHOO, California
GREG WALDEN, Oregon	ELIOT L. ENGEL, New York
LEE TERRY, Nebraska	GENE GREEN, Texas
MIKE ROGERS, Michigan	DIANA DeGETTE, Colorado
TIM MURPHY, Pennsylvania	LOIS CAPPS, California
MICHAEL C. BURGESS, Texas	MICHAEL F. DOYLE, Pennsylvania
MARSHA BLACKBURN, Tennessee	JANICE D. SCHAKOWSKY, Illinois
<i>Vice Chairman</i>	JIM MATHESON, Utah
PHIL GINGREY, Georgia	G.K. BUTTERFIELD, North Carolina
STEVE SCALISE, Louisiana	JOHN BARROW, Georgia
ROBERT E. LATTA, Ohio	DORIS O. MATSUI, California
CATHY McMORRIS RODGERS, Washington	DONNA M. CHRISTENSEN, Virgin Islands
GREGG HARPER, Mississippi	KATHY CASTOR, Florida
LEONARD LANCE, New Jersey	JOHN P. SARBANES, Maryland
BILL CASSIDY, Louisiana	JERRY McNERNEY, California
BRETT GUTHRIE, Kentucky	BRUCE L. BRALEY, Iowa
PETE OLSON, Texas	PETER WELCH, Vermont
DAVID B. MCKINLEY, West Virginia	BEN RAY LUJAN, New Mexico
CORY GARDNER, Colorado	PAUL TONKO, New York
MIKE POMPEO, Kansas	
ADAM KINZINGER, Illinois	
H. MORGAN GRIFFITH, Virginia	
GUS M. BILIRAKIS, Florida	
BILL JOHNSON, Ohio	
BILLY LONG, Missouri	
RENEE L. ELLMERS, North Carolina	

---

## SUBCOMMITTEE ON ENERGY AND POWER

ED WHITFIELD, Kentucky

*Chairman*

STEVE SCALISE, Louisiana	BOBBY L. RUSH, Illinois
<i>Vice Chairman</i>	<i>Ranking Member</i>
RALPH M. HALL, Texas	JERRY McNERNEY, California
JOHN SHIMKUS, Illinois	PAUL TONKO, New York
JOSEPH R. PITTS, Pennsylvania	ELIOT L. ENGEL, New York
LEE TERRY, Nebraska	GENE GREEN, Texas
MICHAEL C. BURGESS, Texas	LOIS CAPPS, California
ROBERT E. LATTA, Ohio	MICHAEL F. DOYLE, Pennsylvania
BILL CASSIDY, Louisiana	JOHN BARROW, Georgia
PETE OLSON, Texas	DORIS O. MATSUI, California
DAVID B. MCKINLEY, West Virginia	DONNA M. CHRISTENSEN, Virgin Islands
CORY GARDNER, Colorado	KATHY CASTOR, Florida
MIKE POMPEO, Kansas	JOHN D. DINGELL, Michigan ( <i>ex officio</i> )
ADAM KINZINGER, Illinois	HENRY A. WAXMAN, California ( <i>ex officio</i> )
H. MORGAN GRIFFITH, Virginia	
JOE BARTON, Texas	
FRED UPTON, Michigan ( <i>ex officio</i> )	

## C O N T E N T S

	Page
Hon. Ed Whitfield, a Representative in Congress from the Commonwealth of Kentucky, opening statement .....	1
Prepared statement .....	3
Hon. Henry A. Waxman, a Representative in Congress from the State of California, opening statement .....	4
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement .....	5
Prepared statement .....	7
Hon. Paul Tonko, a Representative in Congress from the State of New York, opening statement .....	8

### WITNESSES

Ernest J. Moniz, Secretary, Department of Energy .....	9
Prepared statement .....	12
Answers to submitted questions .....	204
Regina McCarthy, Administrator, Environmental Protection Agency .....	30
Prepared statement .....	32
Answers to submitted questions .....	219

### SUBMITTED MATERIAL

Report, "The President's Climate Action Plan," dated June 2013, Executive Office of the President, submitted by Mr. Whitfield .....	39
Invitations, dated August 6, 2013, and follow-up requests, dated September 4, 2013, submitted by Mr. Whitfield .....	60
Hearing memorandum, dated September 16, 2013, submitted by Mr. Whitfield .....	108
Supplement, dated September 2013, "Explaining Extreme Events of 2012 From a Climate Perspective," Bulletin of the American Meteorological Society, Vol. 94, No. 9, submitted by Mr. Whitfield <sup>1</sup> .....	
Charts from report, "International Energy Outlook 2013," dated July 2013, Energy Information Administration, submitted by Mr. Whitfield .....	113
Article, "Making Energy Access Meaningful," dated Summer 2013, by Morgan Bazilian and Roger Pielke, Jr., Issues in Science and Technology, submitted by Mr. Whitfield .....	116
Report, dated September 17, 2013, "Revolution Now: The Future Arrives for Four Clean Energy Technologies," Department of Energy, submitted by Mr. Tonko .....	135
Letter of September 11, 2013, from Jon Bruning, Attorney General, State of Nebraska, to Gina McCarthy, Administrator, Environmental Protection Agency, submitted by Mr. Terry .....	161
Report, dated August 8, 2013, "Human and natural influences on the changing thermal structure of the atmosphere," by Benjamin D. Santer, et al., submitted by Mr. Waxman .....	180

<sup>1</sup> Internet link to the supplement is on page 112.



## **THE OBAMA ADMINISTRATION'S CLIMATE CHANGE POLICIES AND ACTIVITIES**

**WEDNESDAY, SEPTEMBER 18, 2013**

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON ENERGY AND POWER,  
COMMITTEE ON ENERGY AND COMMERCE,  
*Washington, DC.*

The subcommittee met, pursuant to call, at 10:18 a.m., in room 2123 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Scalise, Hall, Shimkus, Pitts, Terry, Burgess, Latta, Olson, McKinley, Gardner, Pompeo, Kinzinger, Griffith, Barton, Upton (ex officio), McNerney, Tonko, Engel, Green, Capps, Doyle, Barrow, Matsui, Christensen, Castor, Dingell (ex officio), and Waxman (ex officio).

Also present: Representative Schakowsky.

Staff present: Nick Abraham, Legislative Clerk; Gary Andres, Staff Director; Charlotte Baker, Press Secretary; Shawn Bonyun, Communications Director; Matt Bravo, Professional Staff Member; Allison Busbee, Policy Coordinator, Energy and Power; Patrick Currier, Counsel, Energy and Power; Tom Hassenboehler, Chief Counsel, Energy and Power; Brandon Mooney, Professional Staff Member; Gib Mullan, Chief Counsel, Commerce, Manufacturing, and Trade; Mary Neumayr, Senior Energy Counsel; Andrew Powaleny, Deputy Press Secretary; Peter Spencer, Professional Staff Member, Oversight; Tom Wilbur, Digital Media Advisor; Phil Barnett, Democratic Staff Director; Alison Cassady, Democratic Senior Professional Staff Member; Greg Dotson, Democratic Staff Director, Energy and Environment; Bruce Ho, Democratic Counsel; Roger Sherman, Democratic Chief Counsel; Ryan Skukowski, Democratic Staff Assistant; and Alexandra Tietz, Democratic Senior Counsel, Energy and Environment.

### **OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY**

Mr. WHITFIELD. I would like to call this hearing to order this morning. Today, the subcommittee is having a hearing to explore President Obama's Climate Change Action Plan. And I certainly want to thank Secretary of Energy, Mr. Moniz; and Gina McCarthy, our new Administrator at the Environmental Protection Agency, for joining us this morning. And I want to be sure we start the clock so that I don't speak forever because that would be pretty

boring for everybody. But I did want to thank you two for being with us this morning.

I will tell you that I am extremely disappointed. We sent letters to the Department of Agriculture, Department of Defense, Health and Human Services, Department of the Interior, Department of State, Transportation, Ex-Im Bank, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, Office of Science and Technology Policy, and the U.S. Agency for International Development because they are very much involved in this Action Plan as well, and they did not send witnesses to testify.

Now, in June of this year, President Obama went to Georgetown University and he gave his speech in which he announced a Climate Change Action Plan for America. And in that speech he mentioned that he was tired of excuses for inaction. Now, I am just going to tell you I take exception to that because in his Action Plan he included many of the component parts of the cap-and-trade legislation that was considered by the Congress in 2009, the Waxman-Markey bill. And that legislation passed the House but it did not pass the U.S. Senate. So, rather than inaction on the part of Congress, Congress made a decision, and that was that it did not want to adopt that legislation.

So I understand the President's view on climate change. And I would like to predicate this by saying worldwide CO<sub>2</sub> emissions last year amounted to 800 gigatons. Of that, 30 gigatons are caused by humans. That is 3.75 percent of all worldwide emissions come from human activity. So the question becomes if you have a broad spectrum of action on this plan, and we know that it is one of the President's priorities and we know that in the last 4 or 5 years we spent \$70 billion on climate change, this year we expect to spend \$22 billion.

So what we are focused on this morning is we want to know more about the plan. Is it going to contribute to higher energy costs? Is it going to raise unemployment rates? Is it going to create obstacles to economic growth? Is it going to have an impact on our ability to compete in the global marketplace?

And I specifically wanted to read from some headlines in newspapers around Europe and elsewhere about this issue. And all of these were within the last 3 months. "Support for the European Union's climate and energy policy eroded further Friday as the Czech Republic became the latest member to denounce subsidies for clean but costly renewable energy and pledged to use more fossil fuels." "Europe's industry is being ravaged by exorbitant energy costs." "Europe's quixotic dash for renewables is pushing electricity costs to untenable levels." "We can't sacrifice Europe's industry for climate goals that are not realistic." "The European Union's energy and climate policy is in disarray and losing credibility." "Utilities are turning to coal and cheap lignite, emitting more CO<sub>2</sub> than ever." "Europe faces a crisis in energy cost."

As you know, the new government in Australia, as their first order of business, have decided to repeal the carbon tax legislation. They also plan to abolish the Climate Commission, the Clean Energy Finance Corporation, and the Climate Change Authority.

Now, so far in the year 2012, 375 coal units at power plants in America are closing, 294 of them because of EPA regulations. In the first half of 2013, 151 coal mines in America have closed.

So this is a discussion today that we recognize we have different views on, but we are trying to make a sincere effort to understand the ramifications, the impact of climate change. As a Congress, we have the responsibility, with all of this money being spent, to get a better feel of what is the government really doing? Because it is comprehensive. It spreads throughout the entire government. And this hearing is about how we want to know what is going on, and we are going to back to every one of those agencies that I mentioned earlier, whether we sit down with them individually or as a committee. We want to know and understand precisely what is going on.

[The prepared statement of Mr. Whitfield follows:]

#### PREPARED STATEMENT OF HON. ED WHITFIELD

In late June, President Obama released his Climate Action Plan, which broadly outlined a variety of executive actions for Federal agencies to implement the administration's climate policies.

On August 6, I wrote thirteen of these agencies, including the White House science advisor's office, requesting testimony and specific information about each agency's climate-related activities and the coordination of that activity across the Federal Government.

Despite six weeks' notice, we will not get many answers today. Eleven agencies requested to testify—twice, I might add—did not provide a witness or submit information about agency activity to the subcommittee. That does not send a positive message for increased public understanding of what this administration is doing on an economically consequential policy matter.

The point of my request was for the subcommittee to examine the scope of Federal climate change actions that have been tolling billions of dollars a year in spending and countless man-hours of work since the mid-1990s, reaching over \$22 billion this year alone. The State Department reports that over the period 2010–2012, the U.S. provided over \$7.5 billion in foreign assistance to address climate change.

This is an oversight hearing. Congress needs specific information from the administration to evaluate the Federal Government's current and planned regulatory actions. Without this information, the public is left out of the debate, without knowing the extent of agency activity, whether it effectively addresses the established risks, or what it really will accomplish.

Whatever you think about managing future climate or global warming risks, oversight of the administration's plans to respond to those risks is critical for Congress to make sound economic and policy decisions. Federal agencies must account transparently for the effectiveness and impact of their actions—especially when a number of these actions collide directly with Americans' efforts to develop our diverse energy resources, which are so vital to economic strength and competitiveness.

Today we will hear from the heads of two Federal agencies, who I have a high respect for, Secretary of Energy Ernest Moniz and EPA Administrator Gina McCarthy—both of whom are aware of my serious concerns with the direction of the administration's climate change policies, especially those being implemented by the EPA.

The President's global warming agenda being implemented through the EPA has been holding back the economy which continues to struggle. Since 2009, the agency has been busy imposing costly requirements on coal-fired electricity and other fossil fuels while targeting manufacturers with new regulatory burdens, only increasing to the economic uncertainty. This week, EPA is expected to release their proposal to control greenhouse gas emissions from power plants, one that is almost certain to further the economic uncertainty facing our Nation's utilities and have devastating effects on our communities and most importantly, the consumers who pay their electricity bills every month.

In my view, this is not a sound economic and climate policy. There is a better path forward, one that stops treating affordable domestic energy and a strong economy as part of the problem and embraces them as a vital part of the solution.

In a number of subcommittee hearings we have explored the ingredients for U.S. economic resurgence. This resurgence in good part depends upon access to affordable and reliable electricity, energy diversity, and embracing the tremendous opportunities presented with our new-found oil and natural gas abundance.

We've begun to see early fruits of what this resurgence could be in the tremendous jobs creation and economic vitality from the shale gas revolution. IHS Global Insight recently reported that this energy revolution has already increased average household income by an average of \$1,200 in 2012, a figure that is projected to grow to \$2,700 in 7 years. Households are spending less on electricity and less on goods and services within the broader economy, all because of less expensive energy.

Building on this momentum, we should set policies that ensure energy access and establish prudent future planning, through electric grid reliability, expanded energy infrastructures of pipelines, roads, ports, increased R&D for energy, agriculture, and increased coal, LNG, and nuclear exports that carry U.S. energy access the world over.

Last week, a delegation from Bangladesh visited me to explain their need for U.S. expertise and help particularly in gaining access to coal-fired electricity. With only about 47 percent of their population having access to electricity, Bangladesh is one of the most energy poor nations on the planet, and one particularly susceptible to extreme weather events, but the World Bank, reflecting the administration's climate policy, had recently turned down funding for Bangladeshi coal development. So today, I hope we can examine how agency priorities meet our positive vision and agenda for economic growth.

I recently read an article that stated that the arctic ice had nearly a million more square miles of ocean covered with ice than at this time last year. But, this hearing is not about the failure of predictions that summer arctic would be ice-free by this year, the 15-year pause in global temperature rise, or the rush to call every horrible weather disaster an omen of climate doom. Clear away the gloom and doom tactics and there are serious issues to address, such as what is needed to build our economy or to bring meaningful energy access to Bangladesh, but you have to be serious about it. I look forward to hearing from our two agencies today on exactly what the administration's climate plan entails for a vision of economic resurgence and energy access to all.

Mr. WHITFIELD. So, once again, Mr. Secretary and Madam Administrator, thank you for being with us.

At this time, I would like to recognize the gentleman from California, Mr. Waxman, for his opening statement.

**OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA**

Mr. WAXMAN. Thank you, Mr. Chairman.

Today's hearing is the first time in a long time that this committee is holding a hearing on climate change. I welcome this hearing, and I want to commend Chairman Upton and Chairman Whitfield for holding it. Climate change is the biggest energy challenge we face and a clear and present danger to the United States and to the world.

I also commend the administration for sending Energy Secretary Ernie Moniz and EPA Administrator Gina McCarthy to testify. It is unusual to have two Cabinet Secretaries testifying at a subcommittee hearing. Your presence makes it clear how seriously the administration is taking this hearing.

As Secretary Moniz explains in his statement, the scientific evidence is overwhelming. That is why the President released a comprehensive Climate Action Plan in June. His plan is reasonable, it is affordable, and it will protect our atmosphere for our children and future generations. It will make our country the global leader in the clean energy economy of the future.



In past hearings and markups and in debates on the floor, Republicans on this committee and in the House have opposed many elements included in the President's plan. Last Congress, the House voted 53 times to block action on climate change.

This Congress, the House has already voted to slash funds for research into clean energy and energy efficiency. House appropriators voted to eliminate funding for international negotiations on the climate treaty. And our committee even refused to listen to the scientists. Over the last 2 years, subcommittee Ranking Member Rush and I have written 27 letters requesting hearings on climate change. And until today, no hearing was ever scheduled. I hope today will mark the start of a change in approach.

That is why my question for House Republicans is simple. What is your plan? If you don't like the President's plan, what is your proposal? The President has said he is willing to listen to other ideas for protecting our planet and fulfilling our moral obligation to future generations. What are yours?

Yesterday, I held a forum with the members of the Safe Climate Caucus to hear from Americans who are already experiencing the impacts of climate change. From California to New York, from Iowa to Texas, we heard stories of wildfires, droughts, floods, sea level rise, and record temperatures. Their accounts were moving and powerful. These extreme weather events are happening now and they are costing lives, destroying livelihoods, eliminating jobs, creating billion-dollar disaster relief legislation.

We need to start addressing this enormous threat now. The longer we wait, the more damage we will cause, the more deeply we will need to cut carbon pollution, the bigger the bill will be for taxpayers, and the further we will fall behind China and Germany in the race to develop the new energy technologies of the future.

The President was right. We don't have time for another meeting of the Flat Earth Society. Saying no to every solution is not a plan. Doing nothing is not a plan. If all the Republicans on this committee do today is criticize, they are either denying the science or ignoring it. No one can accept what the scientists are telling us and fail to support a plan of action.

That is why I hope we can move past denial and start a constructive dialogue. Secretary Moniz and Administrator McCarthy have both told me they want to work with the stakeholders in implementing the President's plan. They would welcome working with Congress, especially with this committee, which has vast jurisdiction over our Nation's energy policies.

We should listen closely to their testimony today. Where we disagree, let's offer alternative solutions. The climate clock is ticking and too much is at stake for more politics as usual.

Thank you, Mr. Chairman, for this chance for an opening statement.

Mr. WHITFIELD. Thank you, Mr. Waxman.

At this time, I would like to recognize the chairman of the full committee, Mr. Upton, for 5 minutes.

**OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN**

Mr. UPTON. Well, thank you, Mr. Chairman.

Today's hearing is about oversight of the President's climate change policies and activities, and it is disappointing that 11 agencies, which had ample notice to identify witnesses, including scientists, and work with staff to accommodate them on different panels, chose instead to decline our request. Climate policy is a central feature of this administration's energy policy, and given the tens of billions of dollars currently being spent on climate activities, there is no good reason for so many agencies to decide that they cannot testify before this committee.

When the administration first attempted to impose its climate policies on the American public through the cap-and-trade legislation, we needed a reality check, and at that time, it was noted that without meaningful international participation, jobs and emissions would simply shift overseas and there would be no meaningful impact on global carbon emissions, or the temperature changes that may result from those emissions. Other nations would continue to seek to grow their own economies and would naturally take advantage of U.S. economic and manufacturing weakness. And we heard that first hand in this committee.

Last week, the Labor Department reported that there are still 11.3 million people unemployed, including 4.3 million long-term unemployed, and 7.9 million "involuntary" part-time workers, whose hours have been cut back or are unable to find full-time jobs. It makes no sense to impose an ineffectual and economically harmful energy policy, one I would remind folks that was rejected through the front door here in the Congress by Senate Democrats.

Unfortunately, the administration is now working to circumvent Congress through the backdoor, seeking to regulate what it was unable to legislate no matter perhaps what the cost to jobs and the economy really is. Thoughtful oversight is necessary so that the public can understand more clearly what is happening and what the impacts of the administration's climate policies may be. And I believe that it is a disservice to the public to suggest a policy approach will meaningfully address climate risks when in fact it will not, despite tens of billions of dollars spent and countless jobs lost.

So today, with the help of the private innovation and America's newfound energy abundance, the U.S. indeed is the envy of the world as it relates to energy access and the safe and responsible development of energy resources. We stand at the very threshold of profound economic opportunity for the Nation and its future generations.

So we should pursue constructing a new architecture of abundance as a central feature for future economic strength and to provide the economic foundation to address climate risks. There should be no question that the economic wherewithal fostered by America's energy resurgence will provide a wide avenue for innovation that will answer energy and environmental challenges of the future.

Yes, it is good to have Secretary Moniz and Administrator McCarthy before us this morning. You two stand at the center of energy policy in this Nation and your agencies will play either positive or negative roles to ensure a strong, vibrant, and innovative energy sector in the future.

My interest is to understand how you intend to address the new realities of American energy abundance, and what your respective agencies' roles should be in promoting access to abundant, affordable energy resources that are so necessary to meeting future challenges in making our Nation more competitive. I look forward to having that discussion.

And I yield back my time.

[The prepared statement of Mr. Upton follows:]

#### PREPARED STATEMENT OF HON. FRED UPTON

Today's hearing is about oversight of the President's climate change policies and activities. It is disappointing that 11 agencies, which had ample notice to identify witnesses, including scientists, and work with staff to accommodate them on different panels, chose instead to decline our request. Climate policy is a central feature of this administration's energy policy, and given the billions of dollars currently being spent on climate activities, there is no good reason for so many agencies to decide they cannot testify before this committee.

When the administration first attempted to impose its climate policies on the American public via cap-and-trade legislation in 2009, we needed a reality check.

At that time, it was noted that without meaningful international participation, jobs and emissions would simply shift overseas—and there would be no meaningful impact on global carbon emissions, or the temperature changes that may result from those emissions. Other nations would continue to seek to grow their own economies and would naturally take advantage of U.S. economic and manufacturing weakness.

Last week the Labor Department reported that there are still 11.3 million people unemployed, including 4.3 million long-term unemployed, and 7.9 million “involuntary” part-time workers, whose hours have been cut back or are unable to find full-time jobs.

It makes no sense to impose an ineffectual and economically harmful energy policy—one I would remind folks that was rejected through the front door here in Congress by Senate Democrats. Unfortunately, the administration is now working to circumvent Congress through the back door—seeking to regulate what it was unable to legislate no matter what the cost to jobs and the economy. Thoughtful oversight is necessary so the public can understand more clearly what is happening, and what the impacts of the administration's climate policies may be. And I believe it is a disservice to the public to suggest a policy approach will meaningfully address climate risks when in effect it will not, despite tens of billions of dollars spent and countless jobs lost.

Today, with the help of private innovation and America's newfound energy abundance, the U.S. is the envy of the world as it relates to energy access and the safe and responsible development of energy resources. We stand at the threshold of profound economic opportunity for the Nation and its future generations.

We should pursue constructing a new architecture of abundance as a central feature for future economic strength and to provide the economic foundation to address climate risks. There should be no question that the economic wherewithal fostered by America's energy resurgence will provide a wide avenue for innovation that will answer energy and environmental challenges of the future.

It is good to have Secretary Moniz and Administrator McCarthy before us this morning. You two stand at the center of energy policy in this Nation and your agencies will play either positive or negative roles to ensure a strong, vibrant, and innovative energy sector in the future.

My interest is to understand how you intend to address the new realities of American energy abundance, and what your respective agencies' roles should be in promoting access to abundant, affordable energy resources that are so necessary to meeting future challenges. I look forward to having that discussion.

Mr. WHITFIELD. The gentleman yields back.

At this time I recognize the gentleman from New York, Mr. Tonko, for a 5-minute opening statement.

**OPENING STATEMENT OF HON. PAUL TONKO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK**

Mr. TONKO. Thank you, Mr. Chair. And thank you, Chair Whitfield, for holding this very important hearing.

The International Panel on Climate Change will soon issue its latest report summarizing the findings of recent climate science. That report is likely to reiterate the message they sent us 5 years ago. Greenhouse gases continue to rise in the atmosphere, the planet is warming, sea level is rising, and a significant degree of this change is attributable to human activities. We are seeing the impacts already. Higher sea levels create more perilous conditions when hurricanes approach the coast. Higher temperatures enhance drought conditions, creating significant losses for farmers and ranchers and set the stage for more intense, widespread forest fires.

Our infrastructure, our communities, and our economy are all vulnerable to these changes. Add to these facts that our infrastructure is aging and we are neglecting to maintain the very systems that we rely on to support a modern, thriving society. We can continue along our current path leaving State and local governments to fend for themselves, patching things together as they wear out, are damaged, or are destroyed. Or we can use the tremendous intellectual and entrepreneurial resources that we have to address the challenge of climate change.

Our current path of inaction leaves tremendous opportunities for job creation, for social progress, and for economic growth untapped. It wastes resources, especially human resources. President Obama realizes this and has offered a modest, balanced plan to reduce greenhouse gases and to rebuild and redesign the modern and resilient infrastructure that we require for the future.

The administration's plan seeks to realize the potential of new, cleaner energy technologies. At the same time, the plan recognizes the important role that fossil fuels play in our economy. We continue to use these fuels, as will other nations, but that does not mean we need to use them inefficiently or without regard to the increasing risk that they pose for the future of our planet.

Our citizens could be employed building our 21st century transportation, energy, and water infrastructure. Our manufacturers could be supplying the parts and equipment for a modern electric grid, a high-speed rail, wind farms, combined heat and power systems, energy-efficient vehicles, fuel cells, and advanced batteries. Other nations are moving forward incentivizing and assisting their industries and positioning themselves and their citizens for the future. They are thinking long-term while we subject to our Nation to unnecessary austerity and an endless series of stop-gap funding bills. This is not the bold and inspired thinking that created this Nation and made it the great nation that it is.

No one set out to change the chemistry of our atmosphere and set our planet on a new climate trajectory, but it has happened and we must act, act now to slow this process and adapt to the new conditions. The President's plan is a fine start. I am very pleased that we have Secretary Moniz and Administrator McCarthy here with us today. These two officials and their agencies are tasked with a great deal of responsibility for making this plan a success.

Thank you both for being here this morning. I hope this is not our last hearing on this topic and that we will have additional opportunities to hear from other Federal agencies. There is a lot of work to do and we have wasted too much time already.

Thank you again, Chair Whitfield, for holding this very important hearing, and with that, I yield back.

Mr. WHITFIELD. The gentleman yields back. At this time, we will begin with Secretary Moniz, 5 minutes for his opening statement. And once again, Mr. Secretary, thanks for joining us this morning. Be sure and turn your microphone on.

**STATEMENTS OF ERNEST J. MONIZ, SECRETARY, DEPARTMENT OF ENERGY; AND REGINA MCCARTHY, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY**

**STATEMENT OF ERNEST J. MONIZ**

Mr. MONIZ. Thank you. Thank you again, Mr. Chairman, and Ranking Member Waxman, members of the committee. Thank you for the opportunity to speak about the President's Climate Action Plan and in particular the DOE's role in its implementation.

I will start with saying, again, the evidence is overwhelming; the science is clear. The threat from climate change is real and urgent. And the basic science behind climate change is simple: carbon dioxide makes the earth warmer and we are emitting more and more of it into the atmosphere at a rate that has long been understood to have a material cumulative impact on a scale measured in decades, not centuries.

This increase in atmospheric greenhouse gas above all from the combustion of fossil fuels is affecting the climate. Carbon dioxide is particularly important both because of the magnitude of the emissions and because it is long lived in the atmosphere. Again, all of this was known a long time ago. What was not anticipated was the pace at which energy needs would grow to serve 7 billion people on the planet with rapid industrialization. Every ton we emit now irreversibly commits our children and grandchildren to the risk of climate disruption.

Now, while we cannot attribute any particular storm, for example, to climate change, cumulatively, we can say that rising sea levels, increasingly severe droughts, heat waves, wildfires, and major storms are amplified by a warming climate. This is already costing our economy billions of dollars a year, and common sense and prudence demanded that we take action. So that is the driving force behind the President's Climate Action Plan, and its three pillars are to cut carbon pollution domestically, to prepare for the worsening impacts of climate change, and to lead international efforts to combat climate change and prepare for its impacts.

My main focus today will be on what the U.S. can do domestically to reduce carbon pollution, and in particular, on DOE's role in the Climate Action Plan. Of course, many other agencies have critical roles as well. First, we must use our energy more intelligently. I am committed to energy efficiency both to achieve reductions in carbon emissions and to reduce energy bills for families and businesses. The Department of Energy also plays a central role in developing the low carbon technologies of the future. Coal and

natural gas will remain significant sources of energy in the years to come, and that is why DOE has issued a draft solicitation for \$1 billion in loan guarantees for advanced fossil energy technologies that reduce carbon emissions. In addition, DOE has already committed \$6 billion on clean coal technologies all with the goal of enabling the use of fossil fuels and a carbon-constrained world.

Some of the most impressive energy developments in recent years have been in renewable energy technology. DOE recently released a paper called "Revolution Now" that outlines some of these critical clean energy developments for wind, solar, LEDs, and EV batteries. The key message is the pattern of dramatic cost reductions, strong government RD&D and supportive policy, and rapidly increasing deployment, much like the story of unconventional natural gas production that unfolded over the last 30 years.

A clear indicator of the Nation's energy system transformation is the business model evolution taking place in the utilities sector in response to energy efficiency and renewable energy market trends. Changes in energy technologies take time, sustained investment, and stable policies. Even in this age of budget austerity we need to ensure that we continue to invest in clean energy.

As part of the President's Climate Action Plan, the Department of energy will also assist in the development of the Quadrennial Energy Review.

Now, while we must take action to reduce the carbon pollution that causes global warming, impacts from climate change are already here and more are on the way. Let me highlight just one project that demonstrates how we are approaching this in terms of infrastructure resilience. In the aftermath of Sandy, the vulnerability of our electricity and fuels infrastructure to severe storms and flooding was evident. Recently, I was in New Jersey to sign an MOU with Governor Christie and the New Jersey Transit Corporation to design a micro-grid that will provide reliable distributed power for a critical transportation corridor. This is an example of the sort of smart infrastructure we will need throughout the country, and this can provide a first-of-its-kind example for the Nation. It also exemplifies our commitment to work more closely with State and local governments.

The third part of the President's plan is leading international efforts to address climate change. A global effort will be required to future climate damages. Here at DOE we are focused on helping countries around the world expand the use of clean energy, improve energy efficiency, and strengthen global preparedness and resilience to climate change. While the State Department has the lead on international negotiations such as phasing down HFCs, domestic clean energy success will allow America to lead by example and at the same time to open up business opportunities for U.S. companies as a huge global market for clean energy opens up over the next decade.

In conclusion, history has repeatedly shown that we can grow the economy while making tremendous strides in reducing pollution. We will need our smartest scientists, our brightest engineers, and visionary policymakers to get this done. The President has put forth a smart and prudent plan to slow global warming, to prepare

for worsening climate impacts, and to ensure a safer, healthier future for our children and grandchildren. And I might add my grandchildren are 8 and 10 years old, so I am excited to be part of the President's plan to reduce the risks of climate change.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Moniz follows:]

**Statement of Dr. Ernest J. Moniz  
Secretary of Energy  
Before the  
Committee on Energy and Commerce  
Subcommittee on Energy and Power  
U.S. House of Representatives  
September 18, 2013**

Chairmen Upton and Whitfield, Ranking Members Waxman and Rush, and Members of the Committee, thank you for the opportunity to speak about the President's Climate Action Plan and the Department of Energy's role in its implementation.

The evidence is overwhelming, the science is clear, and the threat from climate change is real and urgent. This is my judgment and it is the almost universal judgment of the scientific community. The basic science behind climate change is simple: greenhouse gases make the earth warmer, and we are emitting more and more of them into the atmosphere.

The threat of a warming planet to our communities, our infrastructure and our way of life is also clear. Rising sea levels and increasingly severe droughts, heat waves, wildfires, and major storms are already costing our economy billions of dollars a year and these impacts are only going to grow more severe. Common sense demands that we take action.

This is the driving force behind the President's Climate Action Plan. Its three pillars are to cut carbon pollution domestically, to prepare for the worsening impacts of



climate change and to lead international efforts to combat climate change and prepare for its impacts. This will be done by leveraging the combined efforts of all relevant federal agencies from the Department of Energy and the Environmental Protection Agency, represented here, to the Departments of Defense, Homeland Security, State, Agriculture, Transportation, Interior, Commerce, Health and Human Services, and Treasury to mention just a few.

In addition, we will work internationally with other governments, and domestically with states, localities and, importantly, the private sector, to address the challenge of climate change, while creating new jobs, promoting new industries, saving lives and protecting the environment.

### **The Scientific Basis**

I want to begin today by discussing the drivers of climate change. We have known for over one hundred years that certain trace gases in the atmosphere—most importantly water vapor, carbon dioxide, and methane— trap heat and warm the surface of the Earth. In fact, without greenhouse gases in the atmosphere, the Earth's surface temperature would be around zero degrees Fahrenheit, roughly sixty degrees Fahrenheit colder than it is today. That is well below the temperature needed for life as we know it to have evolved on the planet. It does not take much of a shift in this overall greenhouse effect to cause significant changes in the Earth's temperature. The increase in the quantities of greenhouse gases in the atmosphere as a result of human activity, above all the combustion of fossil fuels, has reached the

point that it is profoundly affecting the climate. How much more severe those impacts become going forward depends primarily on how rapidly and effectively the United States and other nations move to curtail greenhouse gas emissions.

While many greenhouse gases are produced by human action, carbon dioxide is particularly important because it is both long-lived – it can persist in the atmosphere for up to hundreds of years — and it is produced in large quantities by the combustion of fossil fuels. Right now, globally, we are putting around 35 billion metric tonnes of CO<sub>2</sub> into the atmosphere each year from fossil fuel combustion and land use change, with the majority coming from fossil fuels. Given the carbon cycle, the net effect is that the atmosphere retains about half of those emissions, with the rest absorbed by the oceans, forests and vegetation (although those natural sinks may become less efficient as CO<sub>2</sub> atmospheric concentrations rise). The arithmetic is that, without prudent action in the near term, we will approach a doubling of preindustrial carbon dioxide concentrations sometime around midcentury, a level that has been recognized by the scientific community as having major consequences. This means that if we don't start reducing emissions now, there is a very high likelihood that our children and grandchildren will face major climate disruptions.

### **Climate Impacts**

We have an increasingly clear idea of what the consequences of such disruptions will look like. In the short term, while we cannot attribute any particular storm to climate change, we have all seen and experienced the devastation due to recent

extreme weather, such as the severe infrastructure and human impacts that Sandy inflicted on the Northeast. From that storm alone, economic damage has been estimated to be \$65 billion. As sea levels rise, we can expect coastal flooding and the impacts of severe storms to worsen. We have also experienced protracted heat waves and droughts, which strain the power system and put some of our most vulnerable citizens at risk. Combined drought and higher temperatures have exacerbated the risk of forest fires and projections show wildfires will burn larger areas in the future and the season will last longer.

Climate change will have profound impacts on our energy system, which were recently detailed in a DOE report entitled “U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather.” Among the serious vulnerabilities of the energy system to climate change and extreme weather are:

- Rising sea levels and storm surges in the Gulf of Mexico, which produces 50% of U.S. crude oil and natural gas and contains nearly half of the total U.S. refining capacity, could cost the oil and gas production and refining industries \$8 billion per year by 2030. In addition, unconventional oil and gas production is vulnerable to decreasing water availability.
- Power plants are at increased risk of having to undergo partial or full shutdowns due to lack of cooling water and higher temperatures. Last summer, several power plants in the Northeast and Midwest either shut down or sought special permission from federal and state regulatory

agencies to continue operating due to historically high cooling water temperatures.

- Electric transmission lines become less efficient as temperatures increase, and they begin to sag, increasing the risk of transmission interruptions. They are also vulnerable to wildfires, as we are seeing this summer in California.
- Higher temperatures lead to more air conditioning on the hottest days of the year, increasing the stress on the electric grid, requiring the construction of new peaking capacity and potentially increasing electricity bills for consumers.

The wide range of climate related impacts that we are seeing now is not a surprise to the climate science community. Although the specific climate impacts are difficult to predict at small geographic scales, the general trends and patterns were predicted by the science community decades ago.

There are common sense actions that we can take now to reduce our carbon emissions. These actions give us time to adapt, develop low-carbon technologies of the future and leave a better world for our children and grandchildren. That is the goal of the President's Climate Action Plan.

**The President's Climate Action Plan**

The President's plan has three parts. The first is to cut carbon pollution in America. Carbon dioxide is the dominant cause of climate change and, as already discussed, we must begin to reduce emissions now to mitigate its harmful effects.

The vulnerabilities of our energy infrastructure are only the beginning of the risks associated with climate change. As a policy issue, prudence suggests that we should take out an insurance policy, just like any family does on their home or automobile. In this plan, the President has put forward common sense steps that save money (e.g., through energy efficiency), reduce air pollution (e.g., through renewable, nuclear and low-carbon fossil energy deployment), and increase our national security (e.g., through reducing oil dependence).

We have made progress on reducing emissions over the past several years. In 2012, U.S. carbon emissions fell to their lowest level in nearly two decades and we must continue to build on our successes. We have seen unprecedented growth in clean energy and efficiency technology, and market driven substitution of natural gas for coal electricity generation has contributed to this reduction in CO<sub>2</sub> emissions, as have our energy efficiency programs.

However, even if we significantly reduce our emissions of carbon dioxide and other greenhouse gases, we will still experience the effects of our previous emissions. These impacts are "baked into the system." That is why the second part of the

President's plan is to prepare the United States for the worsening consequences of climate change. We are already experiencing climate changes, and we must identify our vulnerabilities and protect and improve our infrastructure so that we are ready for increasingly intense storms, droughts, and heat waves.

Finally, the United States cannot meet the challenge of climate change alone. We must lead international efforts to combat climate change and prepare for its impacts. That is the third part of the President's Plan. Climate change is a global problem, and America's leadership can galvanize international action.

#### **The Department of Energy's role**

The energy system produces over 85% of domestic greenhouse gas emissions. This includes the generation of electricity, the refining of fuels, and the energy used in residential, commercial, industrial and transportation end uses. In 2012, about 42% of our CO<sub>2</sub> emissions came from petroleum, 32% came from coal and 26% came from natural gas. This underscores the central role that the Department of Energy must play in reducing emissions as part of the President's Climate Action Plan.

In addition to the work performed by many other federal agencies, states and localities have often been leaders in renewable energy, energy efficiency and reducing carbon emissions. We will continue to learn from state and local experiences, and in turn, share our best information with state and local officials. We plan to work with them in implementing all aspects of the President's Plan from

identifying vulnerabilities to climate change to finding new ways of reducing carbon pollution.

### **Domestic Mitigation**

My main focus today will be on what we in the U.S. can do domestically to reduce carbon pollution – and how we at DOE are helping. The first thing is to use our energy more intelligently. Right now, we waste enormous amounts of energy. That wasted energy is also wasted money. That is why I am committed to energy efficiency as a means to not only achieve near-term reductions in carbon emissions, but also to significantly reduce energy bills for American families and businesses.

As part of the President's Climate Action Plan, the Department of Energy is working to release a number of energy efficiency rules. We have now finalized a rule covering the standby power of microwave ovens, and we have issued proposals for three more rules covering metal halide lamp fixtures, commercial refrigerators and commercial walk-in coolers and freezers. We are also committed to issuing a proposed rule for electric motors by November with the goal of finalizing all these rules by May of next year.

The rules for commercial refrigerators and commercial walk-in coolers and freezers alone are expected to cut energy bills by up to \$28 billion for consumers and cut emissions by over 350 million metric tons of CO<sub>2</sub> over 30 years. The Administration's goal is for efficiency standards for appliances and federal buildings

put in place in its first and second terms to reduce carbon pollution by at least 3 billion metric tons cumulatively by 2030 -- while continuing to cut families' energy bills. The latest efficiency rules also incorporate the most recent values for the economic benefits of reducing carbon pollution that rely on the most up-to-date peer-reviewed research.

As we work to increase the efficiency of our appliances and electronics, we are also working with industry and consumer organizations to find the fastest and most efficient way to get the job done. The Department encourages the development of market-based solutions that are a result of a consensus from all relevant parties, and has recently finalized several rules through consensus agreements.

Beyond energy efficiency, the Department of Energy also plays a central role in developing the technologies that will be part of a low-carbon future. We invest in advanced fossil energy, nuclear energy, renewable energy, advanced fuels, electric vehicles and other low-carbon technologies. This is part of the President's all-of-the-above approach to energy policy. Coal and natural gas generate almost 70% of the electricity in the United States, and they are projected to remain significant sources of domestic energy in the years to come. The public and private sectors must work together to ensure that all energy sources will be part of a low-carbon future.

That is why, as part of the President's Climate Action Plan, DOE has issued a draft solicitation for eight billion dollars in loan guarantees for advanced fossil energy



technologies. When issued, the solicitation will seek applications for projects and facilities that cover a range of technologies. These technologies could include any fossil technology that is new or significantly improved, as compared to commercial technologies in service in the U.S. Applicants must show that their proposed project avoids, reduces, or sequesters air pollutants or greenhouse gas emissions. We are currently engaging with the public and with industry, and we expect to issue a final solicitation this fall.

Since the beginning of the Administration, DOE has invested<sup>1</sup> around six billion dollars to advance clean coal technologies – particularly in carbon capture, utilization, and storage – that substantially reduce carbon emissions. Coal plays a key role in our energy mix, and the Administration is committed to advancing clean coal technologies to position the U.S. as a global leader in this technology and to help enable continued use of this important domestic energy resource in the low-carbon economy of the future.

This funding supports projects across the country that will inject millions of tons of CO<sub>2</sub> annually into geologic reservoirs over extended periods. We are also putting CO<sub>2</sub> to work in ways that can help offset the cost of capture – like enhanced oil recovery.

---

<sup>1</sup> DOE has obligated nearly \$6 billion to advance CCS technologies. Consistent with sound project management practice, funding is outlayed as projects achieve milestones. Not all funds have been outlayed as many projects remain active.

Combined, these two programs represent \$14 billion in loan guarantees and RD&D investments, all with the goal of enabling the use of coal and other fossil fuels in a carbon-constrained world. These programs are part of a real all-of-the-above clean energy strategy for a low carbon future where efficiency, coal, natural gas, nuclear and renewable sources all have an important role to play, and can successfully compete in a low carbon marketplace. The mix of solutions will vary by region. And since the President took office, we have seen domestic energy production surge. Oil imports are at a twenty year low and domestic oil and gas production are at the highest level in nearly two decades. And yet carbon dioxide emissions have gone down. We can grow our economy and reduce carbon pollution at the same time.

Some of the most impressive developments have been in clean and renewable energy technology. Department of Energy investments made over the past decades are now opening up entire new industries while bolstering existing ones, with dramatic reductions in price and skyrocketing deployment in important clean energy technologies over the last few years. Since the beginning of 2008, wind power capacity has more than tripled and solar power deployment has increased by a factor of ten. Today, photovoltaic modules cost one one-hundredth of what they did 35 years ago – and we are working to make them even cheaper. Since 2009, the number of super-efficient LED lights in the United States has grown 50-fold. And since 2008, the price of electric vehicle batteries has dropped by an estimated 50%.

We are also seeing important progress on nuclear energy. Here in the U.S., there are currently five nuclear reactors under construction. And the Department of Energy has provided a conditional loan guarantee to the Plant Vogtle project in Georgia, where the first reactors to be licensed in the United States with new passively safe features are being constructed. These activities are being closely watched by other utilities that are contemplating similar nuclear projects. And if the financial returns on operations are sufficient to justify the large upfront capital investment we will likely see other companies investing in nuclear energy in the near future. The Administration is also investing in research and development of small modular reactors that offer even more safety features, greater siting flexibility, and potentially lower costs than large reactors.

As part of the President's Climate Action Plan, I also want to mention that the Department of Energy will assist in the development and serve as the Executive Secretariat of the Quadrennial Energy Review, or QER. The goal of the QER will be to translate policy goals into a set of analytically based, clearly articulated actions over a four year planning horizon. It will engage the multiple executive branch agencies that have energy related economic, environmental, security, trade, innovation, and other equities. The process will be led by the Executive Office of the President and will seek input from many quarters. This first-ever review will focus on infrastructure challenges, and will identify the threats, risks, and opportunities for U.S. energy and climate security. It is due to be completed at the end of 2014.

### **Adaptation**

As I said earlier, we must take action to reduce the carbon pollution that causes global warming. However, the science is telling us some climate change impacts are already here and more are on the way. A number of specific actions in the President's Plan will involve DOE in some way, including:

- Developing actionable climate science, through a climate data initiative and continuing to assess climate-change impacts in the United States
- Providing an information toolkit for climate preparedness and resilience
- Supporting a state, local, and tribal task force on climate preparedness and supporting communities as they prepare for climate impacts
- Supporting climate-resilient investment and boosting the resilience of buildings and infrastructure, particularly as we rebuild and learn from Sandy

In this context, let me say more about the recovery from Hurricane Sandy as it illustrates the role that DOE can play in promoting climate preparedness and resilience. With Sandy, the vulnerability of much of our infrastructure to severe storms and flooding was evident. Not only were there direct impacts such as the flooding of tunnels and the destruction of power transformers, the prolonged loss of electric power had impacts on critical infrastructures like water, fuel distribution and transportation systems. The President's Sandy Task force is helping citizens recover from Sandy's destruction, while also building resilience into the infrastructure rebuilding plan.

Recently, I was in Secaucus, New Jersey, to sign a memorandum of understanding with Governor Christie and the New Jersey Transit Corporation. The MOU kicks off the design phase of “NJ TransitGrid,” a new project that will provide highly reliable power for a critical transportation corridor when the traditional grid is compromised. DOE’s Sandia National Laboratory will provide initial design work, building on their extensive experience with microgrids for military installations. This “microgrid” will employ distributed generation technologies such as fuel cells, combined heat and power, and solar with storage so that the power system will be less fragile when infrastructure is taken offline. This is an important example of the sort of resilience we will need throughout the country, and this project can provide a first-of-a-kind example for the Nation, while creating jobs and a more competitive economy.

**International**

The third part of the President’s Plan is leading international efforts to address climate change. Although we are still one of the largest emitters on a per person basis, U.S. emissions represent only about a fifth of the global total. As such, a global effort will be required if we are to avoid increasing climate damages in the future.

To this end, the Administration’s policies include bilateral and multilateral engagement with other countries to reduce greenhouse gas emissions. The international community has come together before to address pressing

environmental problems. In the 1980s, scientists observed that the ozone layer was thinning over Antarctica, and, in 1987, world leaders, including President Ronald Reagan, signed the Montreal Protocol to address ozone depletion by phasing CFCs known to harm it. Beyond addressing the depletion of the ozone layer, the Montreal Protocol has been an effective tool in the effort to combat climate change. CFCs are a potent greenhouse gas, and phasing them out helped the world avoid a significant increase in global temperatures. However, certain substitutes for CFCs, particularly those known as hydrofluorocarbons (or HFCs), are also powerful greenhouse gases. As part of the President's Plan, the Administration is working to amend the Montreal Protocol to phase down HFCs, and we are beginning to make progress with other countries. In early September 2013, President Obama and Chinese President Xi reaffirmed commitments for the US and China, and the G-20 also expressed support for using the institutions and expertise of the Montreal Protocol to phase down the production and consumption of HFCs.

Here at DOE, we are focused on helping countries around the world expand clean energy use and energy efficiency and strengthen global preparedness and resilience to climate change. Initiatives in which DOE has a role include:

- The Major Economies Forum on Climate and Energy is a State Department led effort. DOE has been active in leading one of its spin-offs, the Clean Energy Ministerial, under which we have been promoting energy efficiency, renewable energy, and electric vehicle technology.

- Facilitated by the Clean Energy Ministerial's Super-Efficient Equipment and Appliance Deployment initiative, India became the first country in the world to adopt a comprehensive set of quality and performance standards for solid-state lighting (LEDs). The standards could save as much as 277 billion kilowatt hours of electricity and avoid 254 million metric tons of CO<sub>2</sub> emissions cumulatively between 2015 –2030.
- Working with our international partners to phase out inefficient subsidies for fossil fuels
- Steering global sector public financing towards cleaner energy by limiting U.S. government support for public financing of new coal plants overseas to those facilities that capture and store carbon or those in the world's poorest countries where no alternative exists
- Working with the Carbon Sequestration Leadership Forum, spanning 23 other nations on six continents, to support research and development of cost-effective technologies for the separation and capture of CO<sub>2</sub>, as well as its transport and long-term safe storage.
- Sharing lessons and best practices for assessing climate change impacts and implementing effective climate preparedness and resilience strategies in the energy sector, and
- Engaging in an array of bilateral initiatives to increase efficiency and the deployment of clean energy technology with key countries around the world including China, India, Brazil, and Saudi Arabia to name just a few.

While the State Department has the lead on the international negotiations, it is very clear that our domestic effort will play a critical international role as well: one of leading by example. The world looks to the U.S. to demonstrate both the new low carbon technologies and the policies that drive those technologies into the market. Success in our domestic agenda will be an essential ingredient in a successful global effort to address this challenge, and will at the same time open up business opportunities for U.S. companies.

### **Conclusion**

With new technologies, the recent growth in unconventional gas and oil production, the continued decrease in the costs of renewable energy and our reserves of traditional forms of energy, like coal, the United States may be entering into a period of unprecedented energy abundance. We believe in an all-of-the-above approach to ensure that this energy is used wisely and cleanly in a low carbon economy, and we are putting resources behind it: advanced fossil energy, nuclear power, renewable energy, energy efficiency and advanced transportation.

History has shown repeatedly that we can grow the economy while making tremendous strides in reducing pollution, including acid rain, ozone, lead and other hazardous emissions. I have no doubt that transforming our energy economy will be a challenge. And new technology will be key. We will need our smartest scientists, our brightest engineers, and visionary policy makers to get this done. The President has put forth a smart and prudent plan to slow the effects of climate



change, to prepare for worsening climate impacts and ensure a safer, healthier future for our children, and I am excited to be a part of it.

I look forward to your questions.

Mr. WHITFIELD. Thank you, Mr. Secretary.

And Madam Administrator McCarthy, you are recognized for 5 minutes for your opening statement.

#### STATEMENT OF REGINA MCCARTHY

Ms. MCCARTHY. Thank you, Chairman Whitfield, Congressman Waxman, members of the committee.

In June, the President reaffirmed his commitment to reducing carbon pollution when he directed many Federal agencies, including the EPA, to take meaningful steps to mitigate the current and future damage caused by carbon dioxide emissions and to prepare for climate changes that have been set in motion.

Climate change is one of the greatest challenges of our time. Over 97 percent of climate scientists are convinced that human-caused climate change is occurring. If our changing climate goes unchecked, it will have devastating impacts on the United States and on our planet. Responding to climate change is an urgent public health, safety, national security, and environmental imperative that presents an economic challenge as well as an economic opportunity. Both the economy and the environment must provide for current and future generations. We can and must embrace cutting carbon pollution as a spark for innovation, for job growth, clean energy, and economic growth. The Nation's success over the past 40 years makes clear that environmental protection and economic growth do go hand-in-hand.

The President's Climate Action Plan directs Federal agencies to address climate change using our existing authorities. The plan has three key pillars: cutting carbon pollution in America, preparing for impacts of a changing climate, and leading international efforts to combat climate change.

EPA plays a critical role in the plan's first pillar, which is cutting carbon pollution. Over the past 4 years, EPA has begun to address this task. In 2010 EPA and the National Highway Transportation and Safety Administration along with the auto industry and other stakeholders, worked together to set greenhouse gas and fuel economy standards for model years 2012 to 2025 light-duty vehicles. Over the life of those vehicles, the standards will save an estimated \$1.7 trillion for consumers. It will cut America's oil consumption by 12 billion barrels and reduce greenhouse gas emissions by 6 billion metric tons.

EPA and NHTSA's standards for model year 2014 through 2018 heavy-duty trucks and buses present a similar success story. Under the President's plan, we will be developing a second phase of heavy-duty vehicle standards for post-2018 model years.

Building on that success, the President asked EPA to work with States, utilities, and other key stakeholders to develop plans to reduce carbon pollution from both future as well as existing power plants.

EPA will soon propose carbon pollution standards for future power plants, reflecting new information and the extensive public comment that we received on our 2012 proposal. For existing plants, we are already engaged in outreach to States and a broad group of stakeholders with expertise who can help inform the development of proposed standards, which we expect to issue in June

of 2014. Using these standards, States will have the primary role in developing and implementing plans to address carbon pollution from existing plans, allowing us to capitalize on State leadership and innovation while accounting for regional diversity and providing ample flexibility.

The plan also calls for the development of a comprehensive strategy to address methane emissions. EPA will work with other agencies to reduce these emissions through incentive-based programs.

The President's plan also calls for a broad array of actions to strengthen America's resilience to climate impacts. EPA will incorporate research on impacts into implementation of our existing programs and we will develop information and tools to help decision-makers, including States, localities, and tribes, to better understand and address the current effects and the future effects that we know are coming in a changing climate. EPA is working closely with our Federal agency counterparts on building national resilience, including developing the National Drought Resilience Partnership, ensuring the security of our freshwater supplies and protecting our water utilities.

The President's plan recognizes that we must couple action at home with leadership abroad. Working closely with the State Department, EPA will continue to engage our international partners in efforts to reduce carbon pollution through activities, including public-private partnership efforts to address methane emissions and other short-lived climate pollutants.

In conclusion, the President's plan provides a roadmap for Federal action to meet the challenges of a changing climate, to promote clean energy solutions that capitalize on American innovation and that drive economic growth.

Thank you again and I look forward to answering your questions.  
[The prepared statement of Ms. McCarthy follows:]

**Opening Statement of Regina McCarthy  
Administrator  
U.S. Environmental Protection Agency**

**Hearing on the Obama Administration's Climate Change Policies and  
Activities  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
September 18, 2013**

Chairman Whitfield, Ranking Member Rush, members of the  
Committee: Thank you for the opportunity to testify today.

In June, the President reaffirmed his commitment to reducing  
carbon pollution when he directed many federal agencies, including the  
Environmental Protection Agency, to take meaningful steps to mitigate  
the current and future damage caused by carbon dioxide emissions and  
to prepare for the anticipated climate changes that have already been  
set in motion.

Climate change is one of the greatest challenges of our time.  
Based on the evidence, more than 97% of climate scientists are  
convinced that human caused climate change is occurring. If our  
changing climate goes unchecked, it will have devastating impacts on  
the United States and the planet. Reducing carbon pollution is critically

important to the protection of Americans' health and the environment upon which our economy depends.

Responding to climate change is an urgent public health, safety, national security, and environmental imperative that presents an economic challenge and an economic opportunity. As the President has stated, both the economy and the environment must provide for current and future generations and we can and must embrace cutting carbon pollution as a spark for business innovation, job creation, clean energy and broad economic growth. The United States' success over the past 40 years makes clear that environmental protection and economic growth go hand in hand.

The President's Climate Action Plan directs federal agencies to address climate change using existing executive authorities. The Plan has three key pillars: cutting carbon pollution in America; preparing the country for the impacts of climate change; and leading international efforts to combat global climate change.

#### **Cutting Carbon Pollution**

EPA plays a critical role in implementing the Plan's first pillar, cutting carbon pollution. Over the past four years, EPA has begun to address this task under the Clean Air Act.

Our first steps addressed motor vehicles, which emit nearly a

third of U.S. carbon pollution. EPA and the National Highway Traffic Safety Administration, along with the auto industry and other stakeholders, worked together to set greenhouse gas and fuel economy standards for Model Year 2012 to 2025 light-duty vehicles. Over the life of these vehicles, the standards will save an estimated \$1.7 trillion for consumers and businesses and cut America's oil consumption by 12 billion barrels, while reducing greenhouse gas emissions by 6 billion metric tons.

EPA's and NHTSA's standards for model year 2014 through 2018 heavy-duty trucks and buses present a similar success story. Under the President's Plan, we will be developing a second phase of heavy-duty vehicle standards for post 2018 model years.

Building on this success, the President asked EPA to work with states, utilities and other key stakeholders to develop plans to reduce carbon pollution from future and existing power plants, which are responsible for about 40 percent of America's carbon pollution.

EPA will soon issue new proposed carbon pollution standards for future power plants, reflecting new information and the extensive public comments on our 2012 proposal. For existing plants, we are engaged in outreach to a broad group of stakeholders with expertise who can inform the development of proposed standards, regulations, or guidelines, which we expect to issue in June of 2014. These

guidelines will provide guidance to States, which have the primary role in developing and implementing plans to address carbon pollution from existing plants. This framework will allow us to capitalize on state leadership and innovation while also accounting for regional diversity and providing the necessary flexibility.

The Plan also calls for the development of a comprehensive, interagency strategy to address emissions of methane – a powerful greenhouse gas that also contributes to ozone pollution, but which has substantial economic value. EPA will work with other agencies to assess emissions data, address data gaps, and identify opportunities to reduce methane emissions through incentive-based programs and existing authorities.

#### **Preparing for Impacts of Climate Change**

Even as we work to avoid dangerous climate change, we must strengthen America's resilience to climate impacts we're already experiencing and those that can no longer be avoided. The President's Plan calls for a broad array of actions on this front. EPA will incorporate research on climate impacts into the implementation of our existing programs, and develop information and tools to help decision-makers – including State, local and tribal governments – to better understand and address these impacts. Further, EPA is working closely with our

federal agency counterparts on several other aspects of building our national resilience, including developing the National Drought Resilience Partnership, ensuring the security of our freshwater supplies, protecting our water utilities, and protecting and restoring our forests in the face of a changing climate.

### **International Efforts**

Our changing climate is also a global challenge, and the President's Plan recognizes that the United States must couple action at home with leadership abroad. Working closely with the State Department, EPA will continue to engage our international partners in reducing carbon pollution through an array of activities. These include public-private partnership efforts to address emissions of methane and other short-lived climate pollutants under the Climate and Clean Air Coalition and the Global Methane Initiative, as well as bilateral cooperation with major economies.

### **Conclusion**

The President's Plan provides a roadmap for federal action to meet the pressing challenge of a changing climate—promoting clean energy solutions that capitalize on American innovation and drive



economic growth. EPA looks forward to working with other federal agencies and all stakeholders on these critical efforts.

Thank you again for the opportunity to testify, and I look forward to answering your questions.

Mr. WHITFIELD. Thank you, Madam McCarthy.

And before I begin my questions, I would like to ask unanimous consent to introduce a few relevant documents into the record. I would like to enter, one, the President's Climate Action Plan; two, the invitation letter sent to the Federal agencies requesting witnesses today, the majority committee staff hearing memorandum.

In addition, I would like to enter the special supplement to the bulletin of the American Meteorological Society released this month and entitled "Explaining Extreme Events of 2012 from a Climate Perspective;" excerpts from the Energy Information Administration's annual Energy Outlook 2013, including a chart reflecting world energy-related carbon dioxide emissions 1990 to 2040 and a table reflecting world carbon dioxide emissions by region and country for 1990 through 2040; and finally, an article entitled "Making Energy Access Meaningful" published this summer in the National Academy of Sciences' publication "Issues in Science and Technology." Without objection, the documents will be entered into the record.

[The information follows:]



# THE PRESIDENT'S CLIMATE ACTION PLAN

Executive Office of the President

June 2013



Table of Contents

CUT CARBON POLLUTION IN AMERICA .....	6
I. Deploying Clean Energy .....	6
Cutting Carbon Pollution from Power Plants .....	6
Promoting American Leadership in Renewable Energy .....	6
Unlocking Long-Term Investment in Clean Energy Innovation .....	7
II. Building a 21 <sup>st</sup> -Century Transportation Sector .....	8
Increasing Fuel Economy Standards .....	8
Developing and Deploying Advanced Transportation Technologies .....	8
III. Cutting Energy Waste in Homes, Businesses, and Factories .....	9
Reducing Energy Bills for American Families and Businesses .....	9
IV. Reducing Other Greenhouse Gas Emissions .....	10
Curbing Emissions of Hydrofluorocarbons .....	10
Reducing Methane Emissions .....	10
Preserving the Role of Forests in Mitigating Climate Change .....	11
V. Leading at the Federal Level .....	11
Leading in Clean Energy .....	11
PREPARE THE UNITED STATES FOR THE IMPACTS OF CLIMATE CHANGE .....	12
I. Building Stronger and Safer Communities and Infrastructure .....	12
Directing Agencies to Support Climate-Resilient Investment .....	12
Establishing a State, Local, and Tribal Leaders Task Force on Climate Preparedness .....	13
Supporting Communities as they Prepare for Climate Impacts .....	13
Boosting the Resilience of Buildings and Infrastructure .....	13
Rebuilding and Learning from Hurricane Sandy .....	13
II. Protecting our Economy and Natural Resources .....	14
Identifying Vulnerabilities of Key Sectors to Climate Change .....	14
Promoting Resilience in the Health Sector .....	14
Promoting Insurance Leadership for Climate Safety .....	14
Conserving Land and Water Resources .....	15
Maintaining Agricultural Sustainability .....	15
Managing Drought .....	15
Reducing Wildfire Risks .....	15
Preparing for Future Floods .....	15
III. Using Sound Science to Manage Climate Impacts .....	16

Developing Actionable Climate Science .....	16
Assessing Climate-Change Impacts in the United States .....	16
Launching a Climate Data Initiative .....	16
Providing a Toolkit for Climate Resilience:.....	16
LEAD INTERNATIONAL EFFORTS TO ADDRESS GLOBAL CLIMATE CHANGE.....	17
I. Working with Other Countries to Take Action to Address Climate Change .....	17
Enhancing Multilateral Engagement with Major Economies .....	17
Expanding Bilateral Cooperation with Major Emerging Economies .....	17
Combating Short-Lived Climate Pollutants .....	17
Reducing Emissions from Deforestation and Forest Degradation .....	18
Expanding Clean Energy Use and Cut Energy Waste .....	18
Negotiating Global Free Trade in Environmental Goods and Services.....	19
Phasing Out Subsidies that Encourage Wasteful Consumption of Fossil Fuels .....	20
Leading Global Sector Public Financing Towards Cleaner Energy .....	20
Strengthening Global Resilience to Climate Change .....	20
Mobilizing Climate Finance .....	20
II. Leading Efforts to Address Climate Change through International Negotiations .....	21

## PRESIDENT OBAMA'S CLIMATE ACTION PLAN

*"We, the people, still believe that our obligations as Americans are not just to ourselves, but to all posterity. We will respond to the threat of climate change, knowing that the failure to do so would betray our children and future generations. Some may still deny the overwhelming judgment of science, but none can avoid the devastating impact of raging fires and crippling drought and more powerful storms.*

*The path towards sustainable energy sources will be long and sometimes difficult. But America cannot resist this transition, we must lead it. We cannot cede to other nations the technology that will power new jobs and new industries, we must claim its promise. That's how we will maintain our economic vitality and our national treasure -- our forests and waterways, our croplands and snow-capped peaks. That is how we will preserve our planet, commended to our care by God. That's what will lend meaning to the creed our fathers once declared."*

*-- President Obama, Second Inaugural Address, January 2013*

## THE CASE FOR ACTION

While no single step can reverse the effects of climate change, we have a moral obligation to future generations to leave them a planet that is not polluted and damaged. Through steady, responsible action to cut carbon pollution, we can protect our children's health and begin to slow the effects of climate change so that we leave behind a cleaner, more stable environment.

In 2009, President Obama made a pledge that by 2020, America would reduce its greenhouse gas emissions in the range of 17 percent below 2005 levels if all other major economies agreed to limit their emissions as well. Today, the President remains firmly committed to that goal and to building on the progress of his first term to help put us and the world on a sustainable long-term trajectory. Thanks in part to the Administration's success in doubling America's use of wind, solar, and geothermal energy and in establishing the toughest fuel economy standards in our history, we are creating new jobs, building new industries, and reducing dangerous carbon pollution which contributes to climate change. In fact, last year, carbon emissions from the energy sector fell to the lowest level in two decades. At the same time, while there is more work to do, we are more energy secure than at any time in recent history. In 2012, America's net oil imports fell to the lowest level in 20 years and we have become the world's leading producer of natural gas – the cleanest-burning fossil fuel.

While this progress is encouraging, climate change is no longer a distant threat – we are already feeling its impacts across the country and the world. Last year was the warmest year ever in the contiguous United States and about one-third of all Americans experienced 10 days or more of 100-degree heat. The 12 hottest years on record have all come in the last 15 years. Asthma rates have doubled in the past 30 years and our children will suffer more asthma attacks as air pollution gets worse. And increasing floods, heat waves, and droughts have put farmers out of business, which is already raising food prices dramatically.

These changes come with far-reaching consequences and real economic costs. Last year alone, there were 11 different weather and climate disaster events with estimated losses exceeding \$1 billion each across the United States. Taken together, these 11 events resulted in over \$110 billion in estimated damages, which would make it the second-costliest year on record.

In short, America stands at a critical juncture. Today, President Obama is putting forward a broad-based plan to cut the carbon pollution that causes climate change and affects public health. Cutting carbon pollution will help spark business innovation to modernize our power plants, resulting in cleaner forms of American-made energy that will create good jobs and cut our dependence on foreign oil. Combined with the Administration's other actions to increase the efficiency of our cars and household appliances, the President's plan will reduce the amount of energy consumed by American families, cutting down on their gas and utility bills. The plan, which consists of a wide variety of executive actions, has three key pillars:

- 1) **Cut Carbon Pollution in America:** In 2012, U.S. carbon emissions fell to the lowest level in two decades even as the economy continued to grow. To build on this progress, the Obama Administration is putting in place tough new rules to cut carbon pollution – just like we have for other toxins like mercury and arsenic – so we protect the health of our children and move our economy toward American-made clean energy sources that will create good jobs and lower home energy bills.
- 2) **Prepare the United States for the Impacts of Climate Change:** Even as we take new steps to reduce carbon pollution, we must also prepare for the impacts of a changing climate that are already being felt across the country. Moving forward, the Obama Administration will help state and local governments strengthen our roads, bridges, and shorelines so we can better protect people's homes, businesses and way of life from severe weather.
- 3) **Lead International Efforts to Combat Global Climate Change and Prepare for its Impacts:** Just as no country is immune from the impacts of climate change, no country can meet this challenge alone. That is why it is imperative for the United States to couple action at home with leadership internationally. America must help forge a truly global solution to this global challenge by galvanizing international action to significantly reduce emissions (particularly among the major emitting countries), prepare for climate impacts, and drive progress through the international negotiations.

Climate change represents one of our greatest challenges of our time, but it is a challenge uniquely suited to America's strengths. Our scientists will design new fuels, and our farmers will grow them. Our engineers will devise new sources of energy, our workers will build them, and our businesses will sell them. All of us will need to do our part. If we embrace this challenge, we will not just create new jobs and new industries and keep America on the cutting edge; we will save lives, protect and preserve our treasured natural resources, cities, and coastlines for future generations.

What follows is a blueprint for steady, responsible national and international action to slow the effects of climate change so we leave a cleaner, more stable environment for future generations. It highlights progress already set in motion by the Obama Administration to advance these goals and sets forth new steps to achieve them.

### CUT CARBON POLLUTION IN AMERICA

In 2009, President Obama made a commitment to reduce U.S. greenhouse gas emissions in the range of 17 percent below 2005 levels by 2020. The President remains firmly committed to achieving that goal. While there is more work to do, the Obama Administration has already made significant progress by doubling generation of electricity from wind, solar, and geothermal, and by establishing historic new fuel economy standards. Building on these achievements, this document outlines additional steps the Administration will take – in partnership with states, local communities, and the private sector – to continue on a path to meeting the President’s 2020 goal.

#### *I. Deploying Clean Energy*

**Cutting Carbon Pollution from Power Plants:** Power plants are the largest concentrated source of emissions in the United States, together accounting for roughly one-third of all domestic greenhouse gas emissions. We have already set limits for arsenic, mercury, and lead, but there is no federal rule to prevent power plants from releasing as much carbon pollution as they want. Many states, local governments, and companies have taken steps to move to cleaner electricity sources. More than 35 states have renewable energy targets in place, and more than 25 have set energy efficiency targets.

Despite this progress at the state level, there are no federal standards in place to reduce carbon pollution from power plants. In April 2012, as part of a continued effort to modernize our electric power sector, the Obama Administration proposed a carbon pollution standard for new power plants. The Environmental Protection Agency’s proposal reflects and reinforces the ongoing trend towards cleaner technologies, with natural gas increasing its share of electricity generation in recent years, principally through market forces and renewables deployment growing rapidly to account for roughly half of new generation capacity installed in 2012.

With abundant clean energy solutions available, and building on the leadership of states and local governments, we can make continued progress in reducing power plant pollution to improve public health and the environment while supplying the reliable, affordable power needed for economic growth. By doing so, we will continue to drive American leadership in clean energy technologies, such as efficient natural gas, nuclear, renewables, and clean coal technology.

To accomplish these goals, President Obama is issuing a Presidential Memorandum directing the Environmental Protection Agency to work expeditiously to complete carbon pollution standards for both new and existing power plants. This work will build on the successful first-term effort to develop greenhouse gas and fuel economy standards for cars and trucks. In developing the standards, the President has asked the Environmental Protection Agency to build on state leadership, provide flexibility, and take advantage of a wide range of energy sources and technologies including many actions in this plan.

**Promoting American Leadership in Renewable Energy:** During the President’s first term, the United States more than doubled generation of electricity from wind, solar, and geothermal sources. To ensure America’s continued leadership position in clean energy, President Obama has set a goal to double renewable electricity generation once again by 2020. In order to meet



this ambitious target, the Administration is announcing a number of new efforts in the following key areas:

- **Accelerating Clean Energy Permitting:** In 2012 the President set a goal to issue permits for 10 gigawatts of renewables on public lands by the end of the year. The Department of the Interior achieved this goal ahead of schedule and the President has directed it to permit an additional 10 gigawatts by 2020. Since 2009, the Department of Interior has approved 25 utility-scale solar facilities, nine wind farms, and 11 geothermal plants, which will provide enough electricity to power 4.4 million homes and support an estimated 17,000 jobs. The Administration is also taking steps to encourage the development of hydroelectric power at existing dams. To develop and demonstrate improved permitting procedures for such projects, the Administration will designate the Red Rock Hydroelectric Plant on the Des Moines River in Iowa to participate in its Infrastructure Permitting Dashboard for high-priority projects. Also, the Department of Defense – the single largest consumer of energy in the United States – is committed to deploying 3 gigawatts of renewable energy on military installations, including solar, wind, biomass, and geothermal, by 2025. In addition, federal agencies are setting a new goal of reaching 100 megawatts of installed renewable capacity across the federally subsidized housing stock by 2020. This effort will include conducting a survey of current projects in order to track progress and facilitate the sharing of best practices.
- **Expanding and Modernizing the Electric Grid:** Upgrading the country's electric grid is critical to our efforts to make electricity more reliable, save consumers money on their energy bills, and promote clean energy sources. To advance these important goals, President Obama signed a Presidential Memorandum this month that directs federal agencies to streamline the siting, permitting and review process for transmission projects across federal, state, and tribal governments.

**Unlocking Long-Term Investment in Clean Energy Innovation:** The Fiscal Year 2014 Budget continues the President's commitment to keeping the United States at the forefront of clean energy research, development, and deployment by increasing funding for clean energy technology across all agencies by 30 percent, to approximately \$7.9 billion. This includes investment in a range of energy technologies, from advanced biofuels and emerging nuclear technologies – including small modular reactors – to clean coal. To continue America's leadership in clean energy innovation, the Administration will also take the following steps:

- **Spurring Investment in Advanced Fossil Energy Projects:** In the coming weeks, the Department of Energy will issue a Federal Register Notice announcing a draft of a solicitation that would make up to \$8 billion in (self-pay) loan guarantee authority available for a wide array of advanced fossil energy projects under its Section 1703 loan guarantee program. This solicitation is designed to support investments in innovative technologies that can cost-effectively meet financial and policy goals, including the avoidance, reduction, or sequestration of anthropogenic emissions of greenhouse gases. The proposed solicitation will cover a broad range of advanced fossil energy projects. Reflecting the Department's commitment to continuous improvement in program management, it will take comment on the draft solicitation, with a plan to issue a final solicitation by the fall of 2013.
- **Instituting a Federal Quadrennial Energy Review:** Innovation and new sources of domestic energy supply are transforming the nation's energy marketplace, creating economic

opportunities at the same time they raise environmental challenges. To ensure that federal energy policy meets our economic, environmental, and security goals in this changing landscape, the Administration will conduct a Quadrennial Energy Review which will be led by the White House Domestic Policy Council and Office of Science and Technology Policy, supported by a Secretariat established at the Department of Energy, and involving the robust engagement of federal agencies and outside stakeholders. This first-ever review will focus on infrastructure challenges, and will identify the threats, risks, and opportunities for U.S. energy and climate security, enabling the federal government to translate policy goals into a set of analytically based, clearly articulated, sequenced and integrated actions, and proposed investments over a four-year planning horizon.

## ***II. Building a 21<sup>st</sup>-Century Transportation Sector***

**Increasing Fuel Economy Standards:** Heavy-duty vehicles are currently the second largest source of greenhouse gas emissions within the transportation sector. In 2011, the Obama Administration finalized the first-ever fuel economy standards for Model Year 2014-2018 for heavy-duty trucks, buses, and vans. These standards will reduce greenhouse gas emissions by approximately 270 million metric tons and save 530 million barrels of oil. During the President's second term, the Administration will once again partner with industry leaders and other key stakeholders to develop post-2018 fuel economy standards for heavy-duty vehicles to further reduce fuel consumption through the application of advanced cost-effective technologies and continue efforts to improve the efficiency of moving goods across the United States.

The Obama Administration has already established the toughest fuel economy standards for passenger vehicles in U.S. history. These standards require an average performance equivalent of 54.5 miles per gallon by 2025, which will save the average driver more than \$8,000 in fuel costs over the lifetime of the vehicle and eliminate six billion metric tons of carbon pollution – more than the United States emits in an entire year.

**Developing and Deploying Advanced Transportation Technologies:** Biofuels have an important role to play in increasing our energy security, fostering rural economic development, and reducing greenhouse gas emissions from the transportation sector. That is why the Administration supports the Renewable Fuels Standard, and is investing in research and development to help bring next-generation biofuels on line. For example, the United States Navy and Departments of Energy and Agriculture are working with the private sector to accelerate the development of cost-competitive advanced biofuels for use by the military and commercial sectors. More broadly, the Administration will continue to leverage partnerships between the private and public sectors to deploy cleaner fuels, including advanced batteries and fuel cell technologies, in every transportation mode. The Department of Energy's eGallon informs drivers about electric car operating costs in their state – the national average is only \$1.14 per gallon of gasoline equivalent, showing the promise for consumer pocketbooks of electric-powered vehicles. In addition, in the coming months, the Department of Transportation will work with other agencies to further explore strategies for integrating alternative fuel vessels into the U.S. flag fleet. Further, the Administration will continue to work with states, cities and towns through the Department of Transportation, the Department of Housing and Urban Development, and the Environmental Protection Agency to improve transportation options, and lower transportation costs while protecting the environment in communities nationwide.

### *III. Cutting Energy Waste in Homes, Businesses, and Factories*

**Reducing Energy Bills for American Families and Businesses:** Energy efficiency is one of the clearest and most cost-effective opportunities to save families money, make our businesses more competitive, and reduce greenhouse gas emissions. In the President's first term, the Department of Energy and the Department of Housing and Urban Development completed efficiency upgrades in more than one million homes, saving many families more than \$400 on their heating and cooling bills in the first year alone. The Administration will take a range of new steps geared towards achieving President Obama's goal of doubling energy productivity by 2030 relative to 2010 levels:

- **Establishing a New Goal for Energy Efficiency Standards:** In President Obama's first term, the Department of Energy established new minimum efficiency standards for dishwashers, refrigerators, and many other products. Through 2030, these standards will cut consumers' electricity bills by hundreds of billions of dollars and save enough electricity to power more than 85 million homes for two years. To build on this success, the Administration is setting a new goal: Efficiency standards for appliances and federal buildings set in the first and second terms combined will reduce carbon pollution by at least 3 billion metric tons cumulatively by 2030 – equivalent to nearly one-half of the carbon pollution from the entire U.S. energy sector for one year – while continuing to cut families' energy bills.
- **Reducing Barriers to Investment in Energy Efficiency:** Energy efficiency upgrades bring significant cost savings, but upfront costs act as a barrier to more widespread investment. In response, the Administration is committing to a number of new executive actions. As soon as this fall, the Department of Agriculture's Rural Utilities Service will finalize a proposed update to its Energy Efficiency and Conservation Loan Program to provide up to \$250 million for rural utilities to finance efficiency investments by businesses and homeowners across rural America. The Department is also streamlining its Rural Energy for America program to provide grants and loan guarantees directly to agricultural producers and rural small businesses for energy efficiency and renewable energy systems.

In addition, the Department of Housing and Urban Development's efforts include a \$23 million Multifamily Energy Innovation Fund designed to enable affordable housing providers, technology firms, academic institutions, and philanthropic organizations to test new approaches to deliver cost-effective residential energy. In order to advance ongoing efforts and bring stakeholders together, the Federal Housing Administration will convene representatives of the lending community and other key stakeholders for a mortgage roundtable in July to identify options for factoring energy efficiency into the mortgage underwriting and appraisal process upon sale or refinancing of new or existing homes.

- **Expanding the President's Better Buildings Challenge:** The Better Buildings Challenge, focused on helping American commercial and industrial buildings become at least 20 percent more energy efficient by 2020, is already showing results. More than 120 diverse organizations, representing over 2 billion square feet are on track to meet the 2020 goal: cutting energy use by an average 2.5 percent annually, equivalent to about \$58 million in energy savings per year. To continue this success, the Administration will expand the program to multifamily housing – partnering both with private and affordable

building owners and public housing agencies to cut energy waste. In addition, the Administration is launching the Better Buildings Accelerators, a new track that will support and encourage adoption of State and local policies to cut energy waste, building on the momentum of ongoing efforts at that level.

#### *IV. Reducing Other Greenhouse Gas Emissions*

**Curbing Emissions of Hydrofluorocarbons:** Hydrofluorocarbons (HFCs), which are primarily used for refrigeration and air conditioning, are potent greenhouse gases. In the United States, emissions of HFCs are expected to nearly triple by 2030, and double from current levels of 1.5 percent of greenhouse gas emissions to 3 percent by 2020.

To reduce emissions of HFCs, the United States can and will lead both through international diplomacy as well as domestic actions. In fact, the Administration has already acted by including a flexible and powerful incentive in the fuel economy and carbon pollution standards for cars and trucks to encourage automakers to reduce HFC leakage and transition away from the most potent HFCs in vehicle air conditioning systems. Moving forward, the Environmental Protection Agency will use its authority through the Significant New Alternatives Policy Program to encourage private sector investment in low-emissions technology by identifying and approving climate-friendly chemicals while prohibiting certain uses of the most harmful chemical alternatives. In addition, the President has directed his Administration to purchase cleaner alternatives to HFCs whenever feasible and transition over time to equipment that uses safer and more sustainable alternatives.

**Reducing Methane Emissions:** Curbing emissions of methane is critical to our overall effort to address global climate change. Methane currently accounts for roughly 9 percent of domestic greenhouse gas emissions and has a global warming potential that is more than 20 times greater than carbon dioxide. Notably, since 1990, methane emissions in the United States have decreased by 8 percent. This has occurred in part through partnerships with industry, both at home and abroad, in which we have demonstrated that we have the technology to deliver emissions reductions that benefit both our economy and the environment. To achieve additional progress, the Administration will:

- **Developing an Interagency Methane Strategy:** The Environmental Protection Agency and the Departments of Agriculture, Energy, Interior, Labor, and Transportation will develop a comprehensive, interagency methane strategy. The group will focus on assessing current emissions data, addressing data gaps, identifying technologies and best practices for reducing emissions, and identifying existing authorities and incentive-based opportunities to reduce methane emissions.
- **Pursuing a Collaborative Approach to Reducing Emissions:** Across the economy, there are multiple sectors in which methane emissions can be reduced, from coal mines and landfills to agriculture and oil and gas development. For example, in the agricultural sector, over the last three years, the Environmental Protection Agency and the Department of Agriculture have worked with the dairy industry to increase the adoption of methane digesters through loans, incentives, and other assistance. In addition, when it comes to the oil and gas sector, investments to build and upgrade gas pipelines will not only put more Americans to work, but also reduce emissions and enhance economic productivity. For example, as part of the Administration's effort to improve federal

permitting for infrastructure projects, the interagency Bakken Federal Executive Group is working with industry, as well as state and tribal agencies, to advance the production of oil and gas in the Bakken while helping to reduce venting and flaring. Moving forward, as part of the effort to develop an interagency methane strategy, the Obama Administration will work collaboratively with state governments, as well as the private sector, to reduce emissions across multiple sectors, improve air quality, and achieve public health and economic benefits.

**Preserving the Role of Forests in Mitigating Climate Change:** America's forests play a critical role in addressing carbon pollution, removing nearly 12 percent of total U.S. greenhouse gas emissions each year. In the face of a changing climate and increased risk of wildfire, drought, and pests, the capacity of our forests to absorb carbon is diminishing. Pressures to develop forest lands for urban or agricultural uses also contribute to the decline of forest carbon sequestration. Conservation and sustainable management can help to ensure our forests continue to remove carbon from the atmosphere while also improving soil and water quality, reducing wildfire risk, and otherwise managing forests to be more resilient in the face of climate change. The Administration is working to identify new approaches to protect and restore our forests, as well as other critical landscapes including grasslands and wetlands, in the face of a changing climate.

#### *V. Leading at the Federal Level*

**Leading in Clean Energy:** President Obama believes that the federal government must be a leader in clean energy and energy efficiency. Under the Obama Administration, federal agencies have reduced greenhouse gas emissions by more than 15 percent – the equivalent of permanently taking 1.5 million cars off the road. To build on this record, the Administration is establishing a new goal: The federal government will consume 20 percent of its electricity from renewable sources by 2020 – more than double the current goal of 7.5 percent. In addition, the federal government will continue to pursue greater energy efficiency that reduces greenhouse gas emissions and saves taxpayer dollars.

**Federal Government Leadership in Energy Efficiency:** On December 2, 2011, President Obama signed a memorandum entitled "Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings," challenging federal agencies, in support of the Better Buildings Challenge, to enter into \$2 billion worth of performance-based contracts within two years. Performance contracts drive economic development, utilize private sector innovation, and increase efficiency at minimum costs to the taxpayer, while also providing long-term savings in energy costs. Federal agencies have committed to a pipeline of nearly \$2.3 billion from over 300 reported projects. In coming months, the Administration will take a number of actions to strengthen efforts to promote energy efficiency, including through performance contracting. For example, in order to increase access to capital markets for investments in energy efficiency, the Administration will initiate a partnership with the private sector to work towards a standardized contract to finance federal investments in energy efficiency. Going forward, agencies will also work together to synchronize building codes – leveraging those policies to improve the efficiency of federally owned and supported building stock. Finally, the Administration will leverage the "Green Button" standard – which aggregates energy data in a secure, easy to use format – within federal facilities to increase their ability to manage energy consumption, reduce greenhouse gas emissions, and meet sustainability goals.

## PREPARE THE UNITED STATES FOR THE IMPACTS OF CLIMATE CHANGE

As we act to curb the greenhouse gas pollution that is driving climate change, we must also prepare for the impacts that are too late to avoid. Across America, states, cities, and communities are taking steps to protect themselves by updating building codes, adjusting the way they manage natural resources, investing in more resilient infrastructure, and planning for rapid recovery from damages that nonetheless occur. The federal government has an important role to play in supporting community-based preparedness and resilience efforts, establishing policies that promote preparedness, protecting critical infrastructure and public resources, supporting science and research germane to preparedness and resilience, and ensuring that federal operations and facilities continue to protect and serve citizens in a changing climate.

The Obama Administration has been working to strengthen America's climate resilience since its earliest days. Shortly after coming into office, President Obama established an Interagency Climate Change Adaptation Task Force and, in October 2009, the President signed an Executive Order directing it to recommend ways federal policies and programs can better prepare the Nation for change. In May 2010, the Task Force hosted the first National Climate Adaptation Summit, convening local and regional stakeholders and decision-makers to identify challenges and opportunities for collaborative action.

In February 2013, federal agencies released Climate Change Adaptation Plans for the first time, outlining strategies to protect their operations, missions, and programs from the effects of climate change. The Department of Transportation, for example, is developing guidance for incorporating climate change and extreme weather event considerations into coastal highway projects, and the Department of Homeland Security is evaluating the challenges of changing conditions in the Arctic and along our Nation's borders. Agencies have also partnered with communities through targeted grant and technical-assistance programs—for example, the Environmental Protection Agency is working with low-lying communities in North Carolina to assess the vulnerability of infrastructure investments to sea level rise and identify solutions to reduce risks. And the Administration has continued, through the U.S. Global Change Research Program, to support science and monitoring to expand our understanding of climate change and its impacts.

Going forward, the Administration will expand these efforts into three major, interrelated initiatives to better prepare America for the impacts of climate change:

### ***I. Building Stronger and Safer Communities and Infrastructure***

By necessity, many states, cities, and communities are already planning and preparing for the impacts of climate change. Hospitals must build capacity to serve patients during more frequent heat waves, and urban planners must plan for the severe storms that infrastructure will need to withstand. Promoting on-the-ground planning and resilient infrastructure will be at the core of our work to strengthen America's communities. Specific actions will include:

**Directing Agencies to Support Climate-Resilient Investment:** The President will direct federal agencies to identify and remove barriers to making climate-resilient investments; identify and remove counterproductive policies that increase vulnerabilities; and encourage and support smarter, more resilient investments, including through agency grants, technical assistance, and other programs, in sectors from transportation and water management to conservation and

disaster relief. Agencies will also be directed to ensure that climate risk-management considerations are fully integrated into federal infrastructure and natural resource management planning. To begin meeting this challenge, the Environmental Protection Agency is committing to integrate considerations of climate change impacts and adaptive measures into major programs, including its Clean Water and Drinking Water State Revolving Funds and grants for brownfields cleanup, and the Department of Housing and Urban Development is already requiring grant recipients in the Hurricane Sandy-affected region to take sea-level rise into account.

**Establishing a State, Local, and Tribal Leaders Task Force on Climate Preparedness:** To help agencies meet the above directive and to enhance local efforts to protect communities, the President will establish a short-term task force of state, local, and tribal officials to advise on key actions the federal government can take to better support local preparedness and resilience-building efforts. The task force will provide recommendations on removing barriers to resilient investments, modernizing grant and loan programs to better support local efforts, and developing information and tools to better serve communities.

**Supporting Communities as they Prepare for Climate Impacts:** Federal agencies will continue to provide targeted support and assistance to help communities prepare for climate-change impacts. For example, throughout 2013, the Department of Transportation's Federal Highway Administration is working with 19 state and regional partners and other federal agencies to test approaches for assessing local transportation infrastructure vulnerability to climate change and extreme weather and for improving resilience. The Administration will continue to assist tribal communities on preparedness through the Bureau of Indian Affairs, including through pilot projects and by supporting participation in federal initiatives that assess climate change vulnerabilities and develop regional solutions. Through annual federal agency "Environmental Justice Progress Reports," the Administration will continue to identify innovative ways to help our most vulnerable communities prepare for and recover from the impacts of climate change. The importance of critical infrastructure independence was brought home in the Sandy response. The Federal Emergency Management Agency and the Department of Energy are working with the private sector to address simultaneous restoration of electricity and fuels supply.

**Boosting the Resilience of Buildings and Infrastructure:** The National Institute of Standards and Technology will convene a panel on disaster-resilience standards to develop a comprehensive, community-based resilience framework and provide guidelines for consistently safe buildings and infrastructure – products that can inform the development of private-sector standards and codes. In addition, building on federal agencies' "Climate Change Adaptation Plans," the Administration will continue efforts to increase the resilience of federal facilities and infrastructure. The Department of Defense, for example, is assessing the relative vulnerability of its coastal facilities to climate change. In addition, the President's FY 2014 Budget proposes \$200 million through the Transportation Leadership Awards program for Climate Ready Infrastructure in communities that build enhanced preparedness into their planning efforts, and that have proposed or are ready to break ground on infrastructure projects, including transit and rail, to improve resilience.

**Rebuilding and Learning from Hurricane Sandy:** In August 2013, President Obama's Hurricane Sandy Rebuilding Task Force will deliver to the President a rebuilding strategy to be implemented in Sandy-affected regions and establishing precedents that can be followed

elsewhere. The Task Force and federal agencies are also piloting new ways to support resilience in the Sandy-affected region; the Task Force, for example, is hosting a regional “Rebuilding by Design” competition to generate innovative solutions to enhance resilience. In the transportation sector, the Department of Transportation’s Federal Transit Administration (FTA) is dedicating \$5.7 billion to four of the area’s most impacted transit agencies, of which \$1.3 billion will be allocated to locally prioritized projects to make transit systems more resilient to future disasters. FTA will also develop a competitive process for additional funding to identify and support larger, stand-alone resilience projects in the impacted region. To build coastal resilience, the Department of the Interior will launch a \$100 million competitive grant program to foster partnerships and promote resilient natural systems while enhancing green spaces and wildlife habitat near urban populations. An additional \$250 million will be allocated to support projects for coastal restoration and resilience across the region. Finally, with partners, the U.S. Army Corps of Engineers is conducting a \$20 million study to identify strategies to reduce the vulnerability of Sandy-affected coastal communities to future large-scale flood and storm events, and the National Oceanic and Atmospheric Administration will strengthen long-term coastal observations and provide technical assistance to coastal communities.

## ***II. Protecting our Economy and Natural Resources***

Climate change is affecting nearly every aspect of our society, from agriculture and tourism to the health and safety of our citizens and natural resources. To help protect critical sectors, while also targeting hazards that cut across sectors and regions, the Administration will mount a set of sector- and hazard-specific efforts to protect our country’s vital assets, to include:

**Identifying Vulnerabilities of Key Sectors to Climate Change:** The Department of Energy will soon release an assessment of climate-change impacts on the energy sector, including power-plant disruptions due to drought and the disruption of fuel supplies during severe storms, as well as potential opportunities to make our energy infrastructure more resilient to these risks. In 2013, the Department of Agriculture and Department of the Interior released several studies outlining the challenges a changing climate poses for America’s agricultural enterprise, forests, water supply, wildlife, and public lands. This year and next, federal agencies will report on the impacts of climate change on other key sectors and strategies to address them, with priority efforts focusing on health, transportation, food supplies, oceans, and coastal communities.

**Promoting Resilience in the Health Sector:** The Department of Health and Human Services will launch an effort to create sustainable and resilient hospitals in the face of climate change. Through a public-private partnership with the healthcare industry, it will identify best practices and provide guidance on affordable measures to ensure that our medical system is resilient to climate impacts. It will also collaborate with partner agencies to share best practices among federal health facilities. And, building on lessons from pilot projects underway in 16 states, it will help train public-health professionals and community leaders to prepare their communities for the health consequences of climate change, including through effective communication of health risks and resilience measures.

**Promoting Insurance Leadership for Climate Safety:** Recognizing the critical role that the private sector plays in insuring assets and enabling rapid recovery after disasters, the Administration will convene representatives from the insurance industry and other stakeholders to explore best practices for private and public insurers to manage their own processes and



investments to account for climate change risks and incentivize policy holders to take steps to reduce their exposure to these risks.

**Conserving Land and Water Resources:** America's ecosystems are critical to our nation's economy and the lives and health of our citizens. These natural resources can also help ameliorate the impacts of climate change, if they are properly protected. The Administration has invested significantly in conserving relevant ecosystems, including working with Gulf State partners after the Deepwater Horizon spill to enhance barrier islands and marshes that protect communities from severe storms. The Administration is also implementing climate-adaptation strategies that promote resilience in fish and wildlife populations, forests and other plant communities, freshwater resources, and the ocean. Building on these efforts, the President is also directing federal agencies to identify and evaluate additional approaches to improve our natural defenses against extreme weather, protect biodiversity and conserve natural resources in the face of a changing climate, and manage our public lands and natural systems to store more carbon.

**Maintaining Agricultural Sustainability:** Building on the existing network of federal climate-science research and action centers, the Department of Agriculture is creating seven new Regional Climate Hubs to deliver tailored, science-based knowledge to farmers, ranchers, and forest landowners. These hubs will work with universities and other partners, including the Department of the Interior and the National Oceanic and Atmospheric Administration, to support climate resilience. Its Natural Resources Conservation Service and the Department of the Interior's Bureau of Reclamation are also providing grants and technical support to agricultural water users for more water-efficient practices in the face of drought and long-term climate change.

**Managing Drought:** Leveraging the work of the National Disaster Recovery Framework for drought, the Administration will launch a cross-agency National Drought Resilience Partnership as a "front door" for communities seeking help to prepare for future droughts and reduce drought impacts. By linking information (monitoring, forecasts, outlooks, and early warnings) with drought preparedness and longer-term resilience strategies in critical sectors, this effort will help communities manage drought-related risks.

**Reducing Wildfire Risks:** With tribes, states, and local governments as partners, the Administration has worked to make landscapes more resistant to wildfires, which are exacerbated by heat and drought conditions resulting from climate change. Federal agencies will expand and prioritize forest and rangeland restoration efforts in order to make natural areas and communities less vulnerable to catastrophic fire. The Department of the Interior and Department of Agriculture, for example, are launching a Western Watershed Enhancement Partnership – a pilot effort in five western states to reduce wildfire risk by removing extra brush and other flammable vegetation around critical areas such as water reservoirs.

**Preparing for Future Floods:** To ensure that projects funded with taxpayer dollars last as long as intended, federal agencies will update their flood-risk reduction standards for federally funded projects to reflect a consistent approach that accounts for sea-level rise and other factors affecting flood risks. This effort will incorporate the most recent science on expected rates of sea-level rise (which vary by region) and build on work done by the Hurricane Sandy Rebuilding Task Force, which announced in April 2013 that all federally funded Sandy-related rebuilding projects must meet a consistent flood risk reduction standard that takes into account increased risk from extreme weather events, sea-level rise, and other impacts of climate change.

### ***III. Using Sound Science to Manage Climate Impacts***

Scientific data and insights are essential to help government officials, communities, and businesses better understand and manage the risks associated with climate change. The Administration will continue to lead in advancing the science of climate measurement and adaptation and the development of tools for climate-relevant decision-making by focusing on increasing the availability, accessibility, and utility of relevant scientific tools and information. Specific actions will include:

**Developing Actionable Climate Science:** The President's Fiscal Year 2014 Budget provides more than \$2.7 billion, largely through the 13-agency U.S. Global Change Research Program, to increase understanding of climate-change impacts, establish a public-private partnership to explore risk and catastrophe modeling, and develop the information and tools needed by decision-makers to respond to both long-term climate change impacts and near-term effects of extreme weather.

**Assessing Climate-Change Impacts in the United States:** In the spring of 2014, the Obama Administration will release the third U.S. National Climate Assessment, highlighting new advances in our understanding of climate-change impacts across all regions of the United States and on critical sectors of the economy, including transportation, energy, agriculture, and ecosystems and biodiversity. For the first time, the National Climate Assessment will focus not only on dissemination of scientific information but also on translating scientific insights into practical, useable knowledge that can help decision-makers anticipate and prepare for specific climate-change impacts.

**Launching a Climate Data Initiative:** Consistent with the President's May 2013 Executive Order on Open Data – and recognizing that freely available open government data can fuel entrepreneurship, innovation, scientific discovery, and public benefits – the Administration is launching a Climate Data Initiative to leverage extensive federal climate-relevant data to stimulate innovation and private-sector entrepreneurship in support of national climate-change preparedness.

**Providing a Toolkit for Climate Resilience:** Federal agencies will create a virtual climate-resilience toolkit that centralizes access to data-driven resilience tools, services, and best practices, including those developed through the Climate Data Initiative. The toolkit will provide easy access to existing resources as well as new tools, including: interactive sea-level rise maps and a sea-level-rise calculator to aid post-Sandy rebuilding in New York and New Jersey, new NOAA storm surge models and interactive maps from the National Oceanic and Atmospheric Administration that provide risk information by combining tidal data, projected sea levels and storm wave heights, a web-based tool that will allow developers to integrate NASA climate imagery into websites and mobile apps, access to the U.S. Geological Survey's "visualization tool" to assess the amount of carbon absorbed by landscapes, and a Stormwater Calculator and Climate Assessment Tool developed to help local governments assess stormwater-control measures under different precipitation and temperature scenarios.

## LEAD INTERNATIONAL EFFORTS TO ADDRESS GLOBAL CLIMATE CHANGE

The Obama Administration is working to build on the actions that it is taking domestically to achieve significant global greenhouse gas emission reductions and enhance climate preparedness through major international initiatives focused on spurring concrete action, including bilateral initiatives with China, India, and other major emitting countries. These initiatives not only serve to support the efforts of the United States and others to achieve our goals for 2020, but also will help us move beyond those and bend the post-2020 global emissions trajectory further. As a key part of this effort, we are also working intensively to forge global responses to climate change through a number of important international negotiations, including the United Nations Framework Convention on Climate Change.

### *I. Working with Other Countries to Take Action to Address Climate Change*

**Enhancing Multilateral Engagement with Major Economies:** In 2009, President Obama launched the Major Economies Forum on Energy and Climate, a high-level forum that brings together 17 countries that account for approximately 75 percent of global greenhouse gas emissions, in order to support the international climate negotiations and spur cooperative action to combat climate change. The Forum has been successful on both fronts – having contributed significantly to progress in the broader negotiations while also launching the Clean Energy Ministerial to catalyze the development and deployment of clean energy and efficiency solutions. We are proposing that the Forum build on these efforts by launching a major initiative this year focused on further accelerating efficiency gains in the buildings sector, which accounts for approximately one-third of global carbon pollutions from the energy sector.

### **Expanding Bilateral Cooperation with Major Emerging Economies:**

From the outset, the Obama Administration has sought to intensify bilateral climate cooperation with key major emerging economies, through initiatives like the U.S.-China Clean Energy Research Center, the U.S.-India Partnership to Advance Clean Energy, and the Strategic Energy Dialogue with Brazil.

We will be building on these successes and finding new areas for cooperation in the second term, and we are already making progress: Just this month, President Obama and President Xi Jinping of China reached an historic agreement at their first summit to work to use the expertise and institutions of the Montreal Protocol to phase down the consumption and production of HFCs, a highly potent greenhouse gas. The impact of phasing out HFCs by 2050 would be equivalent to the elimination of two years' worth of greenhouse gas emissions from all sources.

**Combating Short-Lived Climate Pollutants:** Pollutants such as methane, black carbon, and many HFCs are relatively short-lived in the atmosphere, but have more potent greenhouse effects than carbon dioxide. In February 2012, the United States launched the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollution, which has grown to include more than 30 country partners and other key partners such as the World Bank and the U.N. Environment Programme. Major efforts include reducing methane and black carbon from waste and landfills. We are also leading through the Global Methane Initiative, which works with 42 partner countries and an extensive network of over 1,100 private sector participants to reduce methane emissions.

**Reducing Emissions from Deforestation and Forest Degradation:** Greenhouse gas emissions from deforestation, agriculture, and other land use constitute approximately one-third of global emissions. In some developing countries, as much as 80 percent of these emissions come from the land sector. To meet this challenge, the Obama Administration is working with partner countries to put in place the systems and institutions necessary to significantly reduce global land-use-related emissions, creating new models for rural development that generate climate benefits, while conserving biodiversity, protecting watersheds, and improving livelihoods.

In 2012 alone, the U.S. Agency for International Development's bilateral and regional forestry programs contributed to reducing more than 140 million tons of carbon dioxide emissions, including through support for multilateral initiatives such as the Forest Investment Program and the Forest Carbon Partnership Facility. In Indonesia, the Millennium Challenge Corporation is funding a five-year "Green Prosperity" program that supports environmentally sustainable, low carbon economic development in select districts.

The Obama Administration is also working to address agriculture-driven deforestation through initiatives such as the Tropical Forest Alliance 2020, which brings together governments, the private sector, and civil society to reduce tropical deforestation related to key agricultural commodities, which we will build upon.

**Expanding Clean Energy Use and Cut Energy Waste:** Roughly 84 percent of current carbon dioxide emissions are energy-related and about 65 percent of all greenhouse gas emissions can be attributed to energy supply and energy use. The Obama Administration has promoted the expansion of renewable, clean, and efficient energy sources and technologies worldwide through:

- Financing and regulatory support for renewable and clean energy projects
- Actions to promote fuel switching from oil and coal to natural gas or renewables
- Support for the safe and secure use of nuclear power
- Cooperation on clean coal technologies
- Programs to improve and disseminate energy efficient technologies

In the past three years we have reached agreements with more than 20 countries around the world, including Mexico, South Africa, and Indonesia, to support low emission development strategies that help countries to identify the best ways to reduce greenhouse gas emissions while growing their economies. Among the many initiatives that we have launched are:

- The U.S. Africa Clean Energy Finance Initiative, which aligns grant-based assistance with project planning expertise from the U.S. Trade and Development Agency and financing and risk mitigation tools from the U.S. Overseas Private Investment Corporation to unlock up to \$1 billion in clean energy financing.
- The U.S.-Asia Pacific Comprehensive Energy Partnership, which has identified \$6 billion in U.S. export credit and government financing to promote clean energy development in the Asia-Pacific region.

Looking ahead, we will target these and other resources towards greater penetration of renewables in the global energy mix on both a small and large scale, including through our

participation in the Sustainable Energy for All Initiative and accelerating the commercialization of renewable mini-grids. These efforts include:

- **Natural Gas.** Burning natural gas is about one-half as carbon-intensive as coal, which can make it a critical “bridge fuel” for many countries as the world transitions to even cleaner sources of energy. Toward that end, the Obama Administration is partnering with states and private companies to exchange lessons learned with our international partners on responsible development of natural gas resources. We have launched the Unconventional Gas Technical Engagement Program to share best practices on issues such as water management, methane emissions, air quality, permitting, contracting, and pricing to help increase global gas supplies and facilitate development of the associated infrastructure that brings them to market. Going forward, we will promote fuel-switching from coal to gas for electricity production and encourage the development of a global market for gas. Since heavy-duty vehicles are expected to account for 40 percent of increased oil use through 2030, we will encourage the adoption of heavy duty natural gas vehicles as well.
- **Nuclear Power.** The United States will continue to promote the safe and secure use of nuclear power worldwide through a variety of bilateral and multilateral engagements. For example, the U.S. Nuclear Regulatory Commission advises international partners on safety and regulatory best practices, and the Department of Energy works with international partners on research and development, nuclear waste and storage, training, regulations, quality control, and comprehensive fuel leasing options. Going forward, we will expand these efforts to promote nuclear energy generation consistent with maximizing safety and nonproliferation goals.
- **Clean Coal.** The United States works with China, India, and other countries that currently rely heavily on coal for power generation to advance the development and deployment of clean coal technologies. In addition, the U.S. leads the Carbon Sequestration Leadership Forum, which engages 23 other countries and economies on carbon capture and sequestration technologies. Going forward, we will continue to use these bilateral and multilateral efforts to promote clean coal technologies.
- **Energy Efficiency.** The Obama Administration has aggressively promoted energy efficiency through the Clean Energy Ministerial and key bilateral programs. The cost-effective opportunities are enormous: The Ministerial’s Super-Efficient Equipment and Appliance Deployment Initiative and its Global Superior Energy Performance Partnership are helping to accelerate the global adoption of standards and practices that would cut energy waste equivalent to more than 650 mid-size power plants by 2030. We will work to expand these efforts focusing on several critical areas, including: improving building efficiency, reducing energy consumption at water and wastewater treatment facilities, and expanding global appliance standards.

**Negotiating Global Free Trade in Environmental Goods and Services:** The U.S. will work with trading partners to launch negotiations at the World Trade Organization towards global free trade in environmental goods, including clean energy technologies such as solar, wind, hydro and geothermal. The U.S. will build on the consensus it recently forged among the 21 Asia-Pacific Economic Cooperation (APEC) economies in this area. In 2011, APEC economies agreed to reduce tariffs to 5 percent or less by 2015 on a negotiated list of 54 environmental goods. The

APEC list will serve as a foundation for a global agreement in the WTO, with participating countries expanding the scope by adding products of interest. Over the next year, we will work towards securing participation of countries which account for 90 percent of global trade in environmental goods, representing roughly \$481 billion in annual environmental goods trade. We will also work in the Trade in Services Agreement negotiations towards achieving free trade in environmental services.

**Phasing Out Subsidies that Encourage Wasteful Consumption of Fossil Fuels:** The International Energy Agency estimates that the phase-out of fossil fuel subsidies – which amount to more than \$500 billion annually – would lead to a 10 percent reduction in greenhouse gas emissions below business as usual by 2050. At the 2009 G-20 meeting in Pittsburgh, the United States successfully advocated for a commitment to phase out these subsidies, and we have since won similar commitments in other fora such as APEC. President Obama is calling for the elimination of U.S. fossil fuel tax subsidies in his Fiscal Year (FY) 2014 budget, and we will continue to collaborate with partners around the world toward this goal.

**Leading Global Sector Public Financing Towards Cleaner Energy:** Under this Administration, the United States has successfully mobilized billions of dollars for clean energy investments in developing countries, helping to accelerate their transition to a green, low-carbon economy. Building on these successes, the President calls for an end to U.S. government support for public financing of new coal plants overseas, except for (a) the most efficient coal technology available in the world's poorest countries in cases where no other economically feasible alternative exists, or (b) facilities deploying carbon capture and sequestration technologies. As part of this new commitment, we will work actively to secure the agreement of other countries and the multilateral development banks to adopt similar policies as soon as possible.

**Strengthening Global Resilience to Climate Change:** Failing to prepare adequately for the impacts of climate change that can no longer be avoided will put millions of people at risk, jeopardizing important development gains, and increasing the security risks that stem from climate change. That is why the Obama Administration has made historic investments in bolstering the capacity of countries to respond to climate-change risks. Going forward, we will continue to:

- Strengthen government and local community planning and response capacities, such as by increasing water storage and water use efficiency to cope with the increased variability in water supply
- Develop innovative financial risk management tools such as index insurance to help smallholder farmers and pastoralists manage risk associated with changing rainfall patterns and drought
- Distribute drought-resistant seeds and promote management practices that increase farmers' ability to cope with climate impacts.

**Mobilizing Climate Finance:** International climate finance is an important tool in our efforts to promote low-emissions, climate-resilient development. We have fulfilled our joint developed country commitment from the Copenhagen Accord to provide approximately \$30 billion of climate assistance to developing countries over FY 2010-FY 2012. The United States contributed approximately \$7.5 billion to this effort over the three year period. Going forward, we will seek

to build on this progress as well as focus our efforts on combining our public resources with smart policies to mobilize much larger flows of private investment in low-emissions and climate resilient infrastructure.

## ***II. Leading Efforts to Address Climate Change through International Negotiations***

The United States has made historic progress in the international climate negotiations during the past four years. At the Copenhagen Conference of the United Nations Framework Convention on Climate Change (UNFCCC) in 2009, President Obama and other world leaders agreed for the first time that all major countries, whether developed or developing, would implement targets or actions to limit greenhouse emissions, and do so under a new regime of international transparency. And in 2011, at the year-end climate meeting in Durban, we achieved another breakthrough: Countries agreed to negotiate a new agreement by the end of 2015 that would have equal legal force and be applicable to all countries in the period after 2020. This was an important step beyond the previous legal agreement, the Kyoto Protocol, whose core obligations applied to developed countries, not to China, India, Brazil or other emerging countries. The 2015 climate conference is slated to play a critical role in defining a post-2020 trajectory. We will be seeking an agreement that is ambitious, inclusive and flexible. It needs to be ambitious to meet the scale of the challenge facing us. It needs to be inclusive because there is no way to meet that challenge unless all countries step up and play their part. And it needs to be flexible because there are many differently situated parties with their own needs and imperatives, and those differences will have to be accommodated in smart, practical ways.

At the same time as we work toward this outcome in the UNFCCC context, we are making progress in a variety of other important negotiations as well. At the Montreal Protocol, we are leading efforts in support of an amendment that would phase down HFCs; at the International Maritime Organization, we have agreed to and are now implementing the first-ever sector-wide, internationally applicable energy efficiency standards; and at the International Civil Aviation Organization, we have ambitious aspirational emissions and energy efficiency targets and are working towards agreement to develop a comprehensive global approach.

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2327  
Minority (202) 225-3641

August 6, 2013

Major General Charles F. Bolden, Jr.  
Administrator  
National Aeronautics and Space Administration  
NASA Headquarters, Suite 5K39  
Washington, D.C. 20546

Dear Administrator Bolden:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

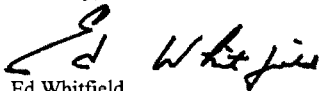


Major General Charles F. Bolden, Jr.  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3841

August 6, 2013

The Honorable Anthony Foxx  
Secretary  
U.S. Department of Transportation  
1200 New Jersey Avenue, S.E.  
Washington, D.C. 20590

Dear Secretary Foxx:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

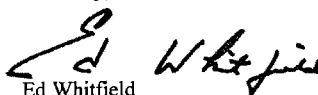
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Anthony Foxx  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
August 6, 2013

The Honorable Chuck Hagel  
Secretary  
U.S. Department of Defense  
1400 Defense Pentagon  
Washington, D.C. 20301

Dear Secretary Hagel:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

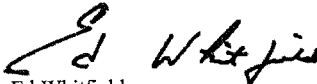
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Chuck Hagel  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3641

August 6, 2013

Mr. Fred P. Hochberg  
Chairman and President  
Export-Import Bank of the United States  
811 Vermont Avenue, N.W.  
Washington, D.C. 20571

Dear Mr. Hochberg:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

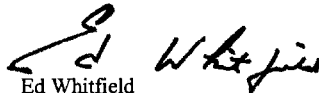
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

Mr. Fred P. Hochberg  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS

## Congress of the United States

### House of Representatives

#### COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2827  
Minority (202) 225-3641

August 6, 2013

Dr. John P. Holdren  
Director  
Office of Science and Technology Policy  
Eisenhower Executive Office Building  
1650 Pennsylvania Avenue  
Washington, D.C. 20504

Dear Dr. Holdren:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

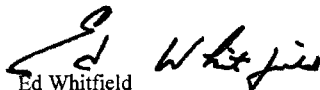


Dr. John P. Holdren  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
August 6, 2013

The Honorable Sally Jewell  
Secretary  
U.S. Department of the Interior  
1849 C Street, N.W.  
Washington, D.C. 20240

Dear Secretary Jewell:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

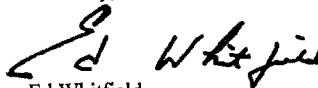
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Sally Jewell  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman

Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2877  
Minority (202) 225-3641  
August 6, 2013

The Honorable John Kerry  
Secretary  
U.S. Department of State  
2201 C Street, N.W.  
Washington, D.C. 20520

Dear Secretary Kerry:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

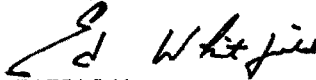
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable John Kerry  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (209) 225-2927  
Minority (202) 225-3641

August 6, 2013

The Honorable Gina McCarthy  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Dear Administrator McCarthy:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

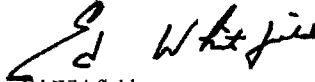
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Gina McCarthy  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3641

August 6, 2013

The Honorable Ernest J. Moniz  
Secretary  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20460

Dear Secretary Moniz:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

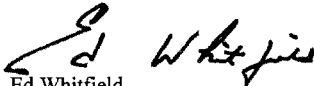


The Honorable Ernest J. Moniz  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (201) 225-2927  
Minority (202) 225-3641  
August 6, 2013

The Honorable Kathleen Sebelius  
Secretary  
U.S. Department of Health and Human Services  
200 Independence Avenue, S.W.  
Washington, D.C. 20101

Dear Secretary Sebelius:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

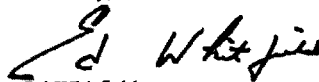
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Kathleen Sebelius  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS

**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3841

August 6, 2013

The Honorable Rajiv Shah  
Administrator  
U.S. Agency for International Development  
Ronald Reagan Building  
1300 Pennsylvania Avenue, N.W.  
Washington, D.C. 20523

Dear Administrator Shah:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

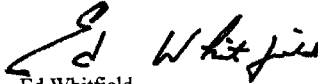
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

The Honorable Rajiv Shah  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman

Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3641

August 6, 2013

Dr. Kathryn Sullivan  
Acting Administrator  
National Oceanic and Atmospheric Administration  
1305 East West Highway  
Silver Spring, MD 20910

Dear Dr. Sullivan:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

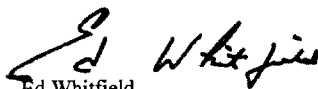
- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

Dr. Kathryn Sullivan  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
August 6, 2013

The Honorable Tom Vilsack  
Secretary  
U.S. Department of Agriculture  
1400 Independence Avenue, S.W.  
Washington, D.C. 20250

Dear Secretary Vilsack:

The Committee on Energy and Commerce is conducting oversight relating to the Administration's current and planned climate change activities, including the actions identified in the President's Climate Action Plan released on June 25, 2013. To assist the Committee and to provide specific information about your agency's climate-related activities, I write to request that you or your designee testify on Wednesday, September 18, 2013, at 10:00 a.m. in 2123 Rayburn House Office Building, at a hearing of the Committee on Energy and Commerce's Subcommittee on Energy and Power entitled "The Obama Administration's Climate Change Policies and Activities."

At the hearing, we seek to hear from relevant Federal agencies about U.S. climate change policies and the Administration's second term climate agenda, and to obtain fuller information regarding the Federal government's past, current, and planned domestic and international activities, climate research programs, initiatives, and new regulatory requirements. In preparing your agency's written testimony, I request that you include the following information:

- (1) Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.
- (2) Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.
- (3) Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.

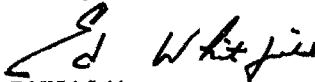


The Honorable Tom Vilsack  
Page 2

- (4) Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed by your agency, if any, since January 2005.
- (5) Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.
- (6) Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.
- (7) Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.
- (8) Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.
- (9) Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.

Please confirm your agency's witness for the September 18, 2013, hearing no later than August 21, 2013, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Henry A. Waxman, Ranking Member, Committee on Energy and Commerce  
The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-4841  
September 4, 2013

Major General Charles F. Bolden, Jr.  
Administrator  
National Aeronautics and Space Administration  
NASA Headquarters, Suite 5K39  
Washington, D.C. 20546

Dear Administrator Bolden:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

Major General Charles F. Bolden, Jr.  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (2013) 225-2927  
Minority (2013) 225-3641  
September 4, 2013

The Honorable Anthony Foxx  
Secretary  
U.S. Department of Transportation  
1200 New Jersey Avenue, S.E.  
Washington, D.C. 20590

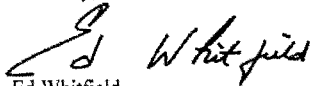
Dear Secretary Foxx:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable Anthony Foxx  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
September 4, 2013

The Honorable Chuck Hagel  
Secretary  
U.S. Department of Defense  
1400 Defense Pentagon  
Washington, D.C. 20301

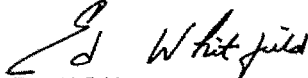
Dear Secretary Hagel:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable Chuck Hagel  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Minority (202) 225-2147  
Minority (202) 225-3641  
September 4, 2013

Mr. Fred P. Hochberg  
Chairman and President  
Export-Import Bank of the United States  
811 Vermont Avenue, N.W.  
Washington, D.C. 20571

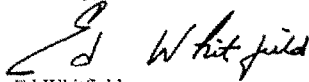
Dear Mr. Hochberg:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power



Mr. Fred P. Hochberg  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3641

September 4, 2013

Dr. John P. Holdren  
Director  
Office of Science and Technology Policy  
Eisenhower Executive Office Building  
1650 Pennsylvania Avenue  
Washington, D.C. 20504

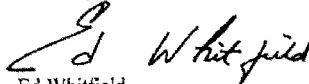
Dear Dr. Holdren:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

Dr. John P. Holdren  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UFTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3643  
September 4, 2013

The Honorable Sally Jewell  
Secretary  
U.S. Department of the Interior  
1849 C Street, N.W.  
Washington, D.C. 20240

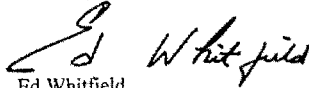
Dear Secretary Jewell:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable Sally Jewell  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Mailing: (202) 225-2927  
Mailing: (202) 225-3841  
September 4, 2013

The Honorable John Kerry  
Secretary  
U.S. Department of State  
2201 C Street, N.W.  
Washington, D.C. 20520

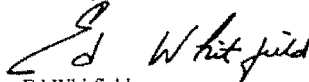
Dear Secretary Kerry:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable John Kerry  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Voice: (202) 225-2927  
Hearing: (202) 225-3641  
September 4, 2013

The Honorable Kathleen Sebelius  
Secretary  
U.S. Department of Health and Human Services  
200 Independence Avenue, S.W.  
Washington, D.C. 20101

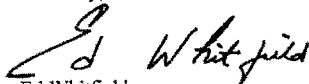
Dear Secretary Sebelius:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power



The Honorable Kathleen Sebelius  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS

## Congress of the United States

### House of Representatives

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-2641

September 4, 2013

The Honorable Rajiv Shah  
Administrator  
U.S. Agency for International Development  
Ronald Reagan Building  
1300 Pennsylvania Avenue, N.W.  
Washington, D.C. 20523

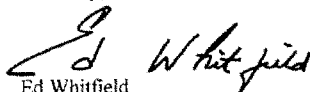
Dear Administrator Shah:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable Rajiv Shah  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
September 4, 2013

Dr. Kathryn Sullivan  
Acting Administrator  
National Oceanic and Atmospheric Administration  
1305 East West Highway  
Silver Spring, MD 20910

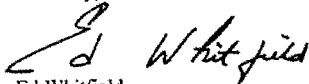
Dear Dr. Sullivan:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

Dr. Kathryn Sullivan  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3541  
September 4, 2013

The Honorable Tom Vilsack  
Secretary  
U.S. Department of Agriculture  
1400 Independence Avenue, S.W.  
Washington, D.C. 20250

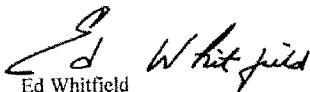
Dear Secretary Vilsack:

On August 6, 2013, I wrote to request that your agency testify before the Committee on Energy and Commerce's Subcommittee on Energy and Power at a hearing scheduled for September 18, 2013. At that hearing, the Subcommittee seeks information and testimony regarding the Administration's current and planned climate change activities, including actions identified in the President's Climate Action Plan. As stated in the invitation letter, the Subcommittee requests testimony from either you or a designee regarding your agency's specific activities.

In view of the broad range of current and planned climate-related activities across federal agencies and programs, it is important that there be thorough Congressional oversight of these activities so that Congress and the public can have a full understanding of what relevant agencies are doing and what additional actions may be undertaken going forward. To date, your agency has not agreed to testify and has not identified a witness. I write to follow up on the Subcommittee's request that your agency testify at the hearing.

Please confirm your agency's witness for the September 18, 2013, hearing no later than September 10, with Nick Abraham of the Majority Committee staff at (202) 225-2927. Additional instructions relating to the hearing and the submission of testimony will be provided under separate cover.

Sincerely,



Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

The Honorable Tom Vilsack  
Page 2

cc: The Honorable Henry A. Waxman, Ranking Member  
Committee on Energy and Commerce

The Honorable Bobby L. Rush, Ranking Member  
Subcommittee on Energy and Power



## THE COMMITTEE ON ENERGY AND COMMERCE

### MEMORANDUM

September 16, 2013

TO: Members, Subcommittee on Energy and Power

FROM: Majority Committee Staff

RE: Hearing on “The Obama Administration’s Climate Change Policies and Activities”

On Wednesday, September 18, 2013, at 10:15 a.m. in 2123 Rayburn House Office Building, the Subcommittee on Energy and Power will hold a hearing on “The Obama Administration’s Climate Change Policies and Activities.” The purpose of this hearing is to conduct oversight of Federal agencies’ current and planned climate change activities, including the actions identified in the President’s Climate Action Plan released on June 25, 2013.

#### I. WITNESSES

Hon. Gina McCarthy	Hon. Ernest Moniz
Administrator	Secretary
U.S. Environmental Protection Agency	U.S. Department of Energy

The following Federal agencies were invited to attend, but declined to provide a witness:

Department of Agriculture (USDA)  
 Department of Defense (DOD)  
 Department of Health and Human Services (HHS)  
 Department of the Interior (DOI)  
 Department of State (DOS)  
 Department of Transportation (DOT)  
 Export-Import Bank of the United States (Ex-Im Bank)  
 National Aeronautics and Space Administration (NASA)  
 National Oceanic and Atmospheric Administration (NOAA)  
 Office of Science and Technology Policy (OSTP)  
 U.S. Agency for International Development (USAID)

#### II. BACKGROUND

For decades, the U.S. government has been spending billions of dollars annually on activities relating to climate change. In 2011, the Government Accountability Office (GAO) issued a report tracking funding going back to 1993 and estimating that it increased from \$2.3 billion in 1993 to over \$8.7 billion in 2010. The Congressional Research Service (CRS) estimated in 2012 that climate change funding for climate science, technology, international assistance and adaptation was approximately \$70 billion for the period 2008 through 2012. The State Department



reports that over the period 2010-2012, the U.S. government provided \$7.5 billion in foreign assistance to address climate change. In August 2013, the Office of Management and Budget (OMB) released a [report](#) estimating that climate change expenditures in 2012 were approximately \$20 billion, and projecting 2013 expenditures would exceed \$22 billion.

Climate change activities across the U.S. government involve an expansive and growing set of domestic and international activities, ranging from research and technology development programs, to regulatory initiatives, to international partnerships and agreements, to adaptation activities.<sup>1</sup> A chart included in the 2011 GAO [report](#) reflecting Federal agencies coordination of climate change related activities is attached as Appendix 1.

On October 5, 2009, the President issued [Executive Order 13514](#), which [requires](#) Federal agencies to submit greenhouse gas reduction targets, increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage Federal purchasing power to promote environmentally-responsible products and technologies. Pursuant to this executive order, 41 Federal agencies have prepared annual sustainability plans that are reviewed and scored by OMB.<sup>2</sup> In 2010, the President's Council on Environmental Quality [released](#) National Environmental Policy Act (NEPA) [draft guidance](#) "on when and how Federal agencies must consider greenhouse gas emissions and climate change in their proposed actions."

Since January 2009, the Administration has advanced a wide range of climate change related regulations, including more than 80 new Environmental Protection Agency (EPA) rules, including its "Endangerment Finding," standards for passenger cars and trucks, standards for medium and heavy duty trucks, preconstruction and operating permitting requirements, proposed standards for new power plants, and rules relating to greenhouse gas monitoring and reporting, as well as EPA plans or commitments to issue new standards for existing power plants, new and existing refineries, and additional standards for trucks and aircraft. Through the Department of Energy, the Administration has developed new energy conservation standards for numerous household and commercial goods and products, ranging from microwave ovens, to furnaces, air conditioners, freezers, refrigerators, kitchen ranges, dishwashers, clothes washers, beverage vending machines, water heaters, and pool heaters and other consumer, commercial and industrial equipment. Since 2009, the Administration also has developed "Social Cost of Carbon" (SCC) estimates for use by Federal agencies "to estimate the climate benefits of rulemakings."<sup>3</sup>

<sup>1</sup> See, e.g., [U.S. Global Change Research Program](#) (13 agency interagency program) and [Related Federal Climate Efforts: Interagency Climate Change Adaptation Task Force](#) (over 20 agency task force); [Federal and EPA Adaptation Programs](#). For information regarding specific agency climate related activities, see, e.g. EPA: [Climate Change](#); DOE: [Office of Climate Change Policy and Technology](#); Office of Energy Efficiency and Renewable Energy: [Appliance and Equipment Standards Program](#); USDA: [Climate Change Across USDA](#); DOD: [DOD Strategic Sustainability Performance Plan FY 2012](#); HHS: [HHS Sustainability and Climate Change](#); DOI: [Climate Change](#); DOS: [Global Climate Change](#); DOT: [The Transportation and Climate Change Clearinghouse](#); Ex-Im Bank: [General Bank Policies on Carbon](#); [General Bank Policies on Energy Efficiency and End-Use Energy Efficiency Exports](#); [Supplemental Guidelines for High Carbon Intensity Projects](#); NASA: [Global Climate Change](#); NOAA: [Climate](#); OSTP: [Environment and Energy](#); USAID: [Environment and Global Climate Change](#).

<sup>2</sup> See [Sustainability](#) (linking to federal agency sustainability plans and OMB scorecards).

<sup>3</sup> See, e.g. [EPA Fact Sheet](#) (July 2013). The Administration convened an interagency group in 2009 that developed a set of SCC estimates for use in regulatory analyses and issued a "[Technical Support Document](#)" in Feb. 2010 and a "[Technical Update](#)" in May 2013.

On June 25, 2013, in a speech at Georgetown University, President Obama announced a “Climate Action Plan” to reduce emissions of carbon dioxide and other greenhouse gases and address adaption and other measures. The plan describes a variety of new or previously announced actions and spending involving agencies across the Federal government. CRS has prepared a report describing these current and planned activities that range from new standards for power plants and trucks, to a 30% increase of funding across Federal agencies for research, development and deployment of “clean energy” technologies, to restrictions on financing of fossil-fuel projects abroad.

On June 25, 2013, the President also issued a Presidential Memorandum directing EPA to re-propose standards for new power plants by September 20, 2013, and finalize that rule in “a timely fashion,” and to propose standards for existing plants by June 1, 2014, finalize those standards by June 1, 2015, and require States to submit implementation plans not later than June 30, 2016.

On August 6 and September 4, 2013, the Subcommittee sent letters to the 13 agencies referenced above, and requested that they testify and provide information regarding their agency’s current and planned climate change activities.

### III. ISSUES

The following issues may be examined at the hearing:

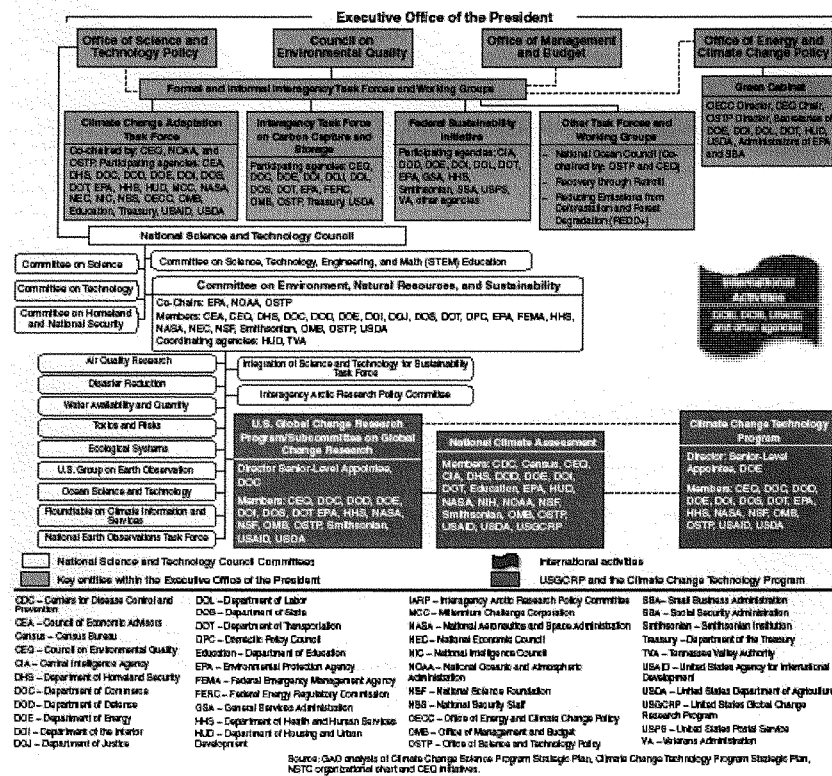
- Activities described in the President’s Climate Action Plan;
- Climate change related research and technology programs and activities;
- Climate change adaptation, mitigation, or sustainability related activities;
- Climate change related task forces, advisory committees, working groups or initiatives;
- Climate change or clean energy related funding, grants or financial assistance programs;
- Climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions;
- Climate change related international agreements, partnerships, working groups or initiatives;
- Annual agency funds attributed to climate change activities;
- Actions undertaken by federal agencies in response to Executive Order 13514; and
- Agency employees and contractors engaged in climate change related activities.

### IV. STAFF CONTACTS

For questions regarding the hearing, please contact Mary Neumayr, Peter Spencer, or Tom Hassenboehler at (202) 225-2927.

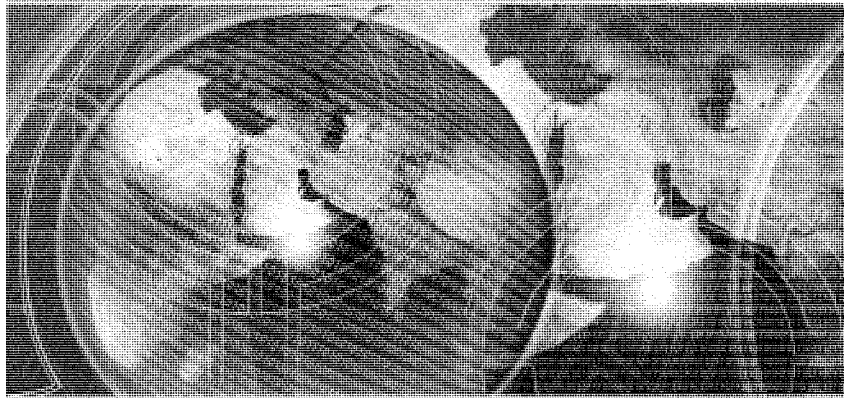
## APPENDIX 1

Figure 4: Selected Coordination Mechanisms for Federal Climate Change Activities

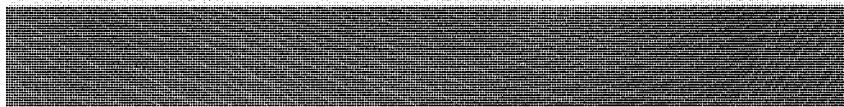


[The American Meteorological Society bulletin supplement is available at <http://docs.house.gov/meetings/IF/IF03/20130918/101308/HHRG-113-IF03-20130918-SD011.pdf>.]

# International Energy Outlook 2013



*Independent Statistics & Analysis*  
U.S. Energy Information  
Administration



**Figure 140. World energy-related carbon dioxide emissions, 1990-2040 (billion metric tons)**

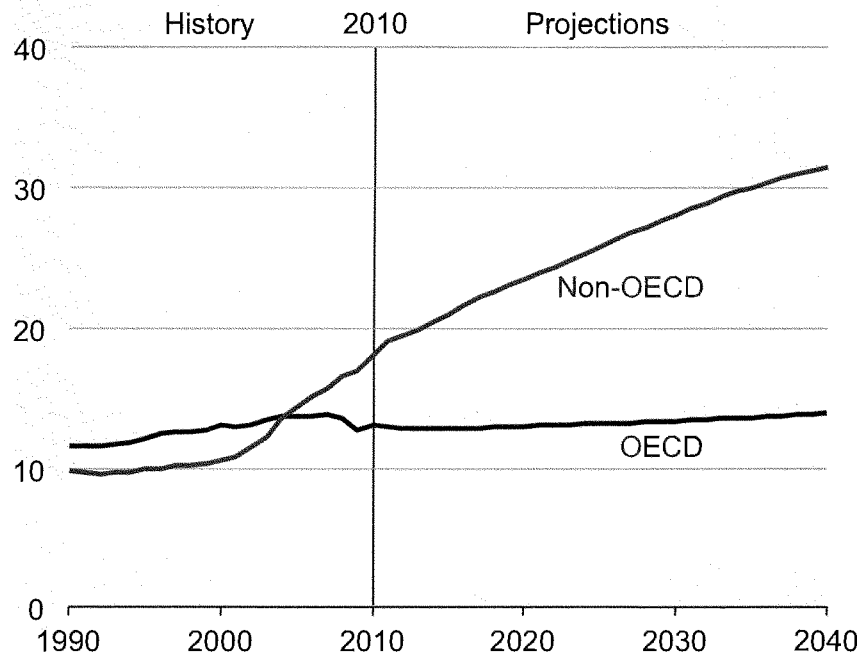


Table 21. World carbon dioxide emissions by region and country in the Reference case, 1990-2040  
(million metric tons)

Region/Country	1990	2010	2020	2030	2040	Average annual percent change	
						1990-2010	2010-2040
<b>OECD</b>							
OECD Americas	5,832	6,657	6,627	6,880	7,283	0.7	0.3
United States	5,032	5,608	5,454	5,523	5,691	0.5	0.0
Canada	466	546	574	609	654	0.8	0.6
Mexico/Chile	334	503	599	748	937	2.1	2.1
OECD Europe	4,195	4,223	4,097	4,151	4,257	0.0	0.0
OECD Asia	1,585	2,200	2,296	2,340	2,358	1.7	0.2
Japan	1,047	1,176	1,220	1,215	1,150	0.6	-0.1
South Korea	242	581	627	666	730	4.5	0.8
Australia/New Zealand	296	443	449	460	478	2.0	0.3
<b>Total OECD</b>	<b>11,612</b>	<b>13,079</b>	<b>13,020</b>	<b>13,373</b>	<b>13,897</b>	<b>0.6</b>	<b>0.2</b>
<b>Non-OECD</b>							
Non-OECD Europe and Eurasia	4,199	2,645	2,898	3,249	3,526	-2.3	1.0
Russia	2,368	1,595	1,749	1,945	2,018	-2.0	0.8
Other	1,831	1,050	1,149	1,304	1,508	-2.7	1.2
Non-OECD Asia	3,652	11,538	15,812	19,392	21,668	5.9	2.1
China	2,270	7,885	11,532	14,028	14,911	6.4	2.1
India	569	1,695	2,109	2,693	3,326	5.6	2.3
Other	814	1,958	2,171	2,671	3,431	4.5	1.9
Middle East	669	1,649	2,126	2,419	2,756	4.6	1.7
Africa	657	1,070	1,224	1,474	1,815	2.5	1.8
Central and South America	663	1,202	1,366	1,556	1,793	3.0	1.3
Brazil	235	450	547	632	771	3.3	1.8
Other	428	752	819	924	1,022	2.9	1.0
<b>Total non-OECD</b>	<b>9,840</b>	<b>18,104</b>	<b>23,426</b>	<b>28,092</b>	<b>31,558</b>	<b>3.1</b>	<b>1.9</b>
<b>World total</b>	<b>21,452</b>	<b>31,183</b>	<b>36,446</b>	<b>41,464</b>	<b>45,453</b>	<b>1.9</b>	<b>1.3</b>

NOTE: Due to an editing oversight the version published by Issues in Science and Technology omitted the figures in this essay. This version includes the figures.

MORGAN BAZILIAN  
ROGER PIELKE, JR.

## Making Energy Access Meaningful

*The world's poor need more than a token supply of electricity. The goal should be to provide the power necessary to boost productivity and raise living standards.*

In a somewhat inconsequential meeting at the United Nations (UN) in 2009, Kandeh Yumkella, the then Director-General of the UN Industrial Development Organization, and UN Secretary-General Ban Ki-moon's informally assigned "energy guy", noted something obvious and profound, namely that, "the provision of one light to poor people does nothing more than shine a light on poverty". Yet much of an emerging discussion on the critical importance of global energy access as a pathway out of poverty continues to focus on what are, in effect, "one light" solutions. In this essay, we seek to help clarify the challenge of energy access, expose assumptions that are informing policy design in the development and diplomatic communities, and offer a framework for future discussions rooted in the aspirations of people around the world to achieve energy access compatible with a decent standard of living.

Our distinctly uncomfortable starting place is that the poorest three-quarters of the global population still only use about ten percent of global energy – a clear indicator of deep and persistent global inequity. Because modern energy supply is foundational for economic development, the international development and diplomatic community has rightly placed the provision of modern energy services at the center of international attention focused on a combined agenda of poverty eradication and sustainable development. This priority has been expressed primarily in the launching of the UN Sustainable Energy for All initiative (SE4All).<sup>1</sup> Still, areas of tension and conflict within such an agenda demand further attention, particularly in relation to climate change, as we discuss later in this essay.

Compounding the difficulty of decision-making in such a complex space is that the concept of "energy access" is often defined in terms that are unacceptably modest. Discussions about energy and poverty commonly assume that the roughly two to three billion people who presently lack modern energy services will only demand or consume them in small amounts over the next several decades. This assumption leads to projections of future energy consumption that are not only potentially far too low, but therefore imply, even if unintentionally, that those billions will remain deeply impoverished. Such limited ambition risks becoming self-fulfilling, because the way we view the scale of the challenge will strongly influence the types of policies, technologies, levels of investment and investment vehicles that analysts and policy makers consider

1. [www.sustainableenergyforall.org](http://www.sustainableenergyforall.org)



to be appropriate.

As Wolfram and colleagues observe in a recent study, “The current forecasts for energy demand in the developing world may be understated because they do not accurately capture the dramatic increase in demand associated with poverty reduction.” The point is that energy access is not an end per se; rather it is a necessity for moving to vibrant and sustainable social and economic growth. The lower the assumed scale of the challenge, the more likely the focus will turn to incremental change that amounts to “poverty management,” rather than the transformational changes that will be necessary if we are to help billions climb out of poverty.

#### Old numbers

A first step to better understanding the scale of the energy access challenge is to ask: How much energy is actually needed to enable poverty alleviation—a level we will term “modern energy access”? To answer this question we focus, for simplicity, on electricity services, rather than energy for heat and cooling or transport. Still, answering the question is not simple. World Bank data shown in Figure 1 shows the wide range of what can be meant by “energy access,” and how it differs, on average, both between countries at “full electrification” as well as in those at much lower access rates. This considerable spread in average annual household consumption levels at different levels of access makes comparing some of the existing analyses tricky.

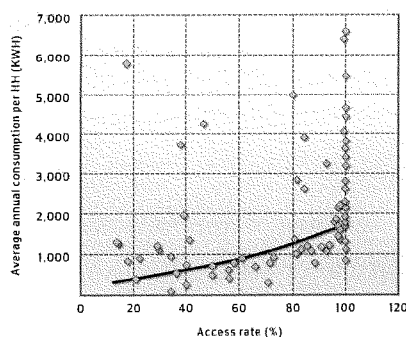


Figure 1: The range of average annual household energy consumption (kWh) across countries with various degrees of “energy access” (World Bank, 2013).

Let’s turn to places which have modern energy access by any definition of the term, with essentially 100% of residents and the broader economy under full electrification. The average resident of the United States consumes about 13,400 kWh per year, with a large variation by state – households in Maine consume about 40% of those in Louisiana. On average, Europeans generally consume considerably less energy than Americans. For instance, based on 2010 data the average resident of Germany consumes about 7,200 kWh per year, with Swedes consuming about 15,000 kWh and Greeks about 5,200 kWh, and on the low end the Bulgarians at about 4,500 kWh, or about 60% of German and a third of US levels. For comparison, the global average in 2010 was just under 3,000 kWh per capita per year, three quarters of Bulgarian consumption, but of course this number is strongly skewed by the enormous concentration of energy use in the industrialized world as well as the large number of people with no access at all.<sup>2</sup>

These numbers for the US, Germany and Bulgaria can be compared to the definitions of energy access that typically provide the basis for policy discussions and analyses. The International Energy Agency is one of the world’s most influential analytical bodies on energy policy and its flagship product, the World Energy Outlook, has played a leadership role for more than a decade in providing analysis and data of the energy access issues. It defines an “initial threshold” for energy access to be 250 kWh per year for rural households and 500 kWh per year for urban households, assuming 5 people per household. This equates to 50-100 kWh/year per person, or about 0.5% of that consumed by the average American or Swede, and 1.7% of the average Bulgarian.

These differences starkly illustrated on Figure 2, which shows various thresholds of per capita energy access. For a sense of scale - the use of a single 60 Watt light bulb four hours per day equates to about 90 kWh over the course of a year (i.e.,  $60W \times 4hr \times 365$  days). The top three bars should global per capita energy access implied for 2035 at 2010 levels for the US, Germany and Bulgaria. Included also are the projections of the US Energy Information Agency for 2035 as well as the actual 2010 per capita levels of 2010 from The World Bank. The bar at the bottom of the graph shows the IEA definition of “energy access,” which is obviously small in comparison to the other five bars. The IEA does, however, assume in

2. Figures from the World Bank and EIA online databases (See recommended reading section)

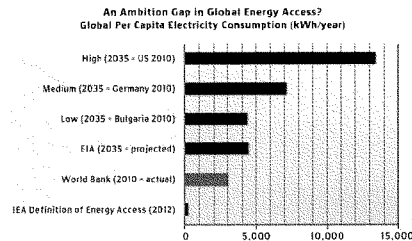


Figure 2: Assumptions of global per capita electricity consumption compared.

its analyses a demand of 750 kWh/year per capita by 2030 for new electricity connections.

For its part, the IEA – and the other organizations active on this issue – have recognized that achieving energy access is a process, noting, “Once initial connection to electricity has been achieved, the level of consumption is assumed to rise gradually over time, attaining the average regional consumption level after five years. This definition of electricity access to include an initial period of growing consumption is a deliberate attempt to reflect the fact that eradication of energy poverty is a long-term endeavour.”

The World Bank presents a useful scheme for considering various levels of energy access, illustrating different "tiers" of access (Table 1). Still, even the highest level of access in the scheme, Tier 5, implies some 2,121 kWh/year per household of five people, or roughly 420 kWh/capita/year, which, at less than 10 percent of Bulgarian consumption, is still much lower than what typical energy services would imply in even the least energy-consuming wealthy countries.

More than a billion people lack even the minimal levels of access to electricity, and policy analyses, national plans, and projects, must start somewhere. Still, achieving minimal levels of energy access is not to be confused with success in achieving goals of modern energy access. The sorts of policies that would make sense to get large numbers of people over a low and arbitrary threshold are very different from those that will underpin sustained growth in economies and consumption. Consider that we do not label people who live on more than \$1 per day as having "economic access" and address policies toward achieving a \$1.25 level, thus still leaving them desperately poor. Everyone understands that \$1.25 a day is still not nearly enough. In energy, we often lack such conceptual clarity.

Adding to the challenge of talking clearly about "modern energy access" and more realistic level of unmet energy demand in poor countries is the tendency in many analyses to discuss the issue in terms of household energy use. Energy access has links to all sectors of the economy. By focusing on household energy demand, other sectors of a growing economy can end up being ignored in critical power planning exercises and policies. Business and industry growth, for example, is severely constrained in many poor countries not only by a lack of access, but also a lack of access to high quality services, meaning those that are reliable enough to meet the needs of private sector enterprises from hospitals to factories. Access to modern energy services across an economy, not just in the home, is necessary to sustain and support continued economic growth - a reality that must be accommodated in projections of future energy needs.

If we aim too low, then there are risks not just in policy failure, but in the opportunity costs of policy success. If more ambitious goals are to be achieved, then some attention must also focus on real transformational change.

TABLE 1

**Tiers of electricity service demand (World Bank, 2013)**

### USE OF ELECTRICITY SERVICES

TIER 1	TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
None	First Ignition AND Primary Ignition for initial	Secondary Ignition AND Secondary for 1st ignition	Tier 2 AND any non-proven and proven	Tier 3 AND any non-proven and proven and proven	Tier 4 AND any non-proven and proven and proven

This type of change is often difficult to conceptualize, and difficult to represent in most analytical models using traditional baseline or incremental growth approaches. But our analytical models should not limit our creativity and ambition, especially in light of the reality that many nations, such as Thailand, South Africa, Vietnam and China, have experienced remarkable economic growth and expansion of truly modern energy access for large populations over relatively short periods of time.

#### New numbers

We now turn directly to the quantitative implications of moving towards much higher levels of assumed future energy demand for poor countries. As an example, consider the Obama Administration's recent announcement of a new "Power Africa" initiative, focused on increasing the electricity generation capacity of sub-Saharan Africa by adding 10 Gigawatts (GW) of capacity, in order to "double access to power." While such an initiative is to be applauded, placing it into context can help to calibrate the level of ambition.

To raise the entire region of sub-Saharan Africa to the average per capita electricity access available in South Africa (which in 2010 was about 4,800 kWh, similar to the level of Bulgaria) would require 1,000 Gigawatts (GW) of installed capacity – about the equivalent electricity of 1,000 medium-sized power plants. This means that sub-Saharan Africa would need to increase its installed capacity by 33 times to reach the level of energy use enjoyed by South Africans — and 100 times to reach that of Americans. A recent study by Bazilian and others (2012) showed that even a less ambitious tenfold increase, perhaps sufficient to provide full access but at relatively modest levels of electricity consumption, would require a 13% average annual growth rate in generating capacity in sub-Saharan Africa, compared to a historical one of 1.7% over the past two decades. When looked at from the perspective of energy access as the concept is understood in North America and Europe, the magnitude of the energy access challenge is starkly revealed.

Still another perspective is provided by the International Institute for Applied Systems Analysis in its 2012 Global Energy Assessment. Figure 3 shows for 10 countries the historical growth in energy access. In 1920, only 35% of Americans had energy access (here shown as "electricity access" defined as "household electrification" at an unspecified level of consumption). This total reached 100% by the mid-1950s or over a period of about 35

years. In contrast, Mexico was at about 35% access in 1930, and has yet to get all the way to the 100% mark. China went from 35% in 1970 to nearly 100% by about 2000, reflecting a very fast rate and in a very large nation. India is following a much shallower trajectory, going from about 25% in 1980 to 65% in 2010. How fast

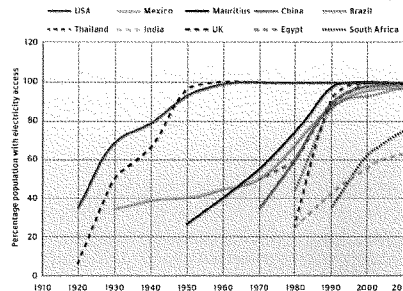


Figure 3: Historical rates of electrification in select countries (GEA, 2012).

and how far can truly modern energy access occur under an approach focused on rapidly expanding access to truly modern levels? This is the sort of question where researchers might productively place further attention. Accelerating a transition to a radically different, and inclusive, energy system is clearly a generational challenge, and provides a just and consequential rationale for much greater attention to innovation in energy systems. A first step in that transition is to properly understand the scale of the challenge. With a sense of scale appropriate to energy access commensurate with the organization of modern economies, we are then in a position to discuss the possible costs of achieving such ambitious goals, recognizing that any such discussion is laden with assumptions about economics, technologies and politics – but also that history is replete with examples of nations moving rapidly to achieve greatly increased levels of access in the context of rapid economic growth.

What sorts of investments might be necessary for achieving modern energy access? Based on recent work done by Bazilian and colleagues (see "recommended readings" at the end of this article – 2010b and forthcoming), it would cost about one trillion dollars to achieve the IEA 2012 World Energy outlook definition of total global access – rising to 750 kWh per capita for new connections by 2030 – and 17 times more to achieve a level of world-

wide access equivalent to South Africa or Bulgaria. This massive difference in estimated costs, likely insensitive to the precise accuracy of either number, places a value on the “ambition gap” that results from the difference between a “poverty management” approach to energy access and one that takes seriously the development aspirations of people around the world. Of course, it is not just cost that changes in the face of such aspirations, but also the sorts of institutions, technologies, infrastructure, policies and other systems required to support broad-based energy services.

#### Climate interactions

Most readers will have already recognized that our discussion has significant implications for the question of climate change. Former NASA scientist James Hansen expressed his view of the issue with typical candor, when he said, “if you let these other countries come up to the level of the developed world then the planet is done for.”<sup>3</sup> For the most part, however, the ambition gap has kept this uncomfortable dilemma off the table. If one assumes that billions will remain with levels of energy consumption an order of magnitude less than even the most modest definition of modern access, then one can understand the oft-repeated claim that universal energy access can be achieved with essentially no increase in the global emissions of carbon dioxide.

For example, Figure 4 shows the projections of the IEA under its “Universal Access Scenario” for energy consumption and carbon dioxide emissions. The minimal

consequences to emissions and consumption resulting from this scenario essentially reflect a “poverty maintenance” level of energy service provision. Emissions increase by such a small amount because new energy consumption increases by a very small amount.

Conflicts between climate and energy priorities deserve a deeper and more open airing in order to help better frame policy options, including the difficult question of trade-offs among competing valued outcomes. The issues are playing out right now, but remain largely unacknowledged. For instance, under US Senate Bill S.329 (2013) the Overseas Private Investment Corporation – a federal agency responsible for backstopping U.S. companies which invest in developing countries – is essentially prohibited from investing in energy projects that involve fossil fuels, a policy that may have profound consequences in places like sub-Saharan Africa that are seeking to develop oil and gas resources to help alleviate widespread energy poverty. At the same time, a different US federal agency – the U.S. Export-Import Bank – helped fund a 4.9 GW coal plant (Kusile) in the Republic of South Africa. The coal plant will help serve both industry and households that currently lack access. These simultaneous interventions appear incoherent. Making such issues more transparent, and opening them up to debates with multiple stakeholders with multiple values and success criteria offers the promise of enriching the array of policy options on the table.

The United Nations has attempted to square this circle of climate and energy through the phrase “Sustainable Energy for All”. Still, since value-judgments must be made

3. <http://www.euractiv.com/science-policymaking/james-hansen-verge-creating-clim-interview-519752>

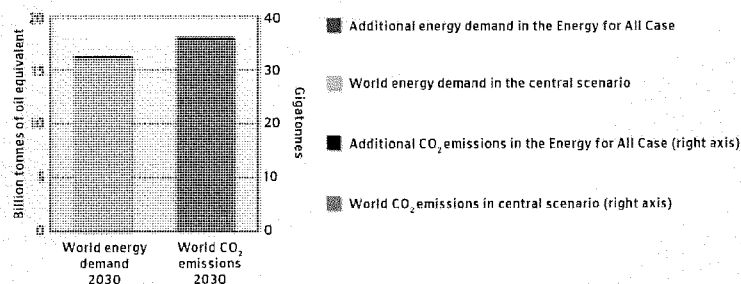


Figure 4: Impacts on energy demand and CO<sub>2</sub> emissions under the IEA's universal energy access scenario (IEA, 2011).

and priorities established, the UN initiative has explicitly stated a “technology neutral” principle and given primacy to national decision-making, and implicitly has made the goal of universal energy access a “first among equals” of the three sustainable energy goals (the other two relating to renewable energy and energy efficiency). In practice however, as we have emphasized, the trade-offs involved in policies related to climate and energy have often received less than a full airing in policy debate.

### Conclusions

The course of development followed by virtually all nations demonstrates that people around the world desire a high-energy future. Our plea is that we begin to recognize that fact, and focus more attention and resources on positively planning for, and indeed bringing about, that future. Achieving universal modern energy access will require transformations – in aspirations, but also, for example, in technological systems, institutions, development theory and practice, and in new ways to conceptualize and finance energy system design. Being clear about what modern energy access means, and applying that clarity to the policy discussions galvanized by the 2014–2024 UN “Decade of Sustainable Energy,” can create a foundation for making huge strides in bridging the global equity gap not just in energy but in the new wealth, rising standard of living, and improved quality of life that modern energy access can help to bring.

Ultimately, a focus on energy access at a low threshold limits our thinking, and thus our options. Adopting a more ambitious conception of energy access brings conflicting priorities, as well as the scale of the challenge, more clearly into focus and makes hidden assumptions more difficult to avoid. Now more than ever the world needs to ensure that the benefits of modern energy are available to all and that energy is provided as cleanly and efficiently as possible. This is a matter of equity, first and foremost, but it is also an issue of urgent practical importance. Economic and technological challenges are hard enough; let us not add a failure of imagination to that mix.

### Recommended reading

M. Bazilian, A. Sagar, R. Detchon, and K. Yumkella, “More Heat and Light,” *Energy Policy* 38 (2010): 5409–5412.

M. Bazilian, P. Nussbaumer, H.-H. Rogner, A. Brew-Hammond, V. Foster, E. Williams, M. Howells, P. Niyongabo, L. Musaba, B. Ó Gallachóir, M. Radka, and D. Kammen, “Access Scenarios to 2030 for the Power Sector in Sub-Saharan Africa,” *Utilities Policy* (2012).

M. Bazilian, P. Nussbaumer, E. Haites, M. Levi, M. Howells, and K. Yumkella, “Understanding the Scale of Investment for Universal Energy Access,” *Geopolitics of Energy* 32 (2010): 19–40.

M. Bazilian, R. Economy, P. Nussbaumer, E. Haites, M. Levi, M. Howells, K. Yumkella, and D. Rothman, “The Scale of Investment for Universal Energy Access Revisited: Beyond Basic Access,” in Sovacool et al., Eds. (Oxford University Press, in press).

GEA, 2012: *Global Energy Assessment – Toward a Sustainable Future*, Cambridge University Press, Cambridge, UK and New York, NY, and the International Institute for Applied Systems Analysis, Laxenburg, Austria.

International Energy Agency, *World Energy Outlook* 2012. Paris, France, 2012. <http://www.worldenergyoutlook.org/resources/energydevelopment/definingandmodellingenergyaccess/>.

N. Nakicenovic and W. Nordhaus, “Editors’ Introduction: The Economics of Technologies to Combat Global Warming,” *Energy Economics* 33, issue 4 (July 2011).

C. Wolfram, O. Shelef, and P. Gertler, *How Will Energy Demand Develop in the Developing World?* (Haas School, University of California, Berkeley, CA, 2012).

World Bank, *Global Tracking Framework*. World Bank Sustainability for All Program, Washington, DC, 2013.

Morgan Bazilian ([Morgan.bazilian@nrel.gov](mailto:Morgan.bazilian@nrel.gov)) is a senior research scientist at the International Institute for Applied Systems Analysis, Laxenburg, Austria. Roger Pielke Jr. ([Pielke@colorado.edu](mailto:Pielke@colorado.edu)) is a professor in the Environmental Studies Program and a fellow of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado, Boulder.

Mr. WHITFIELD. And at this time I will recognize myself for 5 minutes of questions.

Recently, during the August break, I spent time at some universities in the State of Kentucky, and in talking to students, one of their major concerns was trying to find a job upon graduation. And I started thinking about that and I went back and I looked at the last 62 years the unemployment rate in America, and the last 4 years, 2009 through 2012, the unemployment rate has been higher in America than at any time in the last 62 years except for 3 of those years.

Now, in his speech to Georgetown University, the President specifically said that as we transition, try to make this transition, which we know cannot be done overnight, and the President frequently talks about an all-of-the-above policy, but America is the only country in the world where you cannot build a new coal-powered plant because the emission standards cannot be met because the technology is not available. And we know that regulations on existing plants are going to be coming out in 2014 in June.

But in that speech, the President said in talking about his Action Plan, that we must provide special programs for people who lose their jobs. And as I quote it, there have been significant closures of electricity production plants using coal, and over 151 coalmines have been closed. So I would ask either one of you what are the special plans in the President's Action Plan to help address these people who are losing their jobs because of these policies?

Ms. MCCARTHY. Mr. Chairman, let me begin. I just want to indicate that I think that I am sensitive and certainly the Environmental Protection Agency has been sensitive that as we pursue our mission to protect public health and the environment, we have to be sensitive to the economic consequences of our actions—

Mr. WHITFIELD. Then, Ms. McCarthy—

Ms. MCCARTHY [continuing]. Particularly—

Mr. WHITFIELD [continuing]. Do you know specifically what plan is in effect? He talked about we are going to have the special plans to address the concerns of these people who lose their jobs.

Ms. MCCARTHY. I am not familiar with the details of those plans, but I am familiar—

Mr. WHITFIELD. OK.

Ms. MCCARTHY [continuing]. From reading the Climate Action—

Mr. WHITFIELD. OK.

Ms. MCCARTHY [continuing]. Plan that the President—

Mr. WHITFIELD. OK.

Ms. MCCARTHY [continuing]. Sees this as both a challenge as well as an economic—

Mr. WHITFIELD. OK.

Ms. MCCARTHY [continuing]. Opportunity for this—

Mr. WHITFIELD. Now, in looking at the organization chart for the Climate Action Plan, I notice that there is one chart under the Office of Energy and Climate Change Policy referred to as the Green Cabinet. How does the Green Cabinet differentiate from the regular Presidential Cabinet?

Mr. MONIZ. Mr. Chairman, so the Green Cabinet denotes that there are occasional meeting of principals from the agencies who

have special responsibility in the climate action plan so we can get together and discuss coordination of programs, make sure there are not duplications. So it is a subgroup of the Cabinet who again meets periodically together with key White House presidential assistants to discuss the general set of issues——

Mr. WHITFIELD. Um-hum.

Mr. MONIZ [continuing]. Around climate change.

Mr. WHITFIELD. And who is the person at the Department of Energy responsible for the coordination of all the task forces relating to climate change in the government?

Mr. MONIZ. Well, of course, I consider myself as having ultimate responsibility——

Mr. WHITFIELD. Yes, but——

Mr. MONIZ. The action officer——

Mr. WHITFIELD [continuing]. You have designated a——

Mr. MONIZ. The action officer, if you like, is my Chief of Staff, Kevin Knobloch, who is keeping track of all of our responsibilities under the CAP.

Mr. WHITFIELD. Kevin Knobloch?

Mr. MONIZ. Yes.

Mr. WHITFIELD. And, Ms. McCarthy, who is your designated person for this?

Ms. MCCARTHY. Again, I have ultimate responsibility. We have two primary components. We have a mitigation strategy, which we are managing out of our office in Air and Radiation primarily. That would be Janet McCabe, who is currently the acting assistant administrator. On the adaptation side, which is looking at climate resilience and preparedness we had our Office of Policy that is directed by associate administrator Michael Goo.

Mr. WHITFIELD. Now, I noticed the GAO or in the budget there is \$22 billion allocated for climate change Action Plan for 2013. How much of that money will be allocated to EPA?

Ms. MCCARTHY. I am sorry. Could you repeat the question, Mr. Chairman?

Mr. WHITFIELD. There is 22 billion planned to be spent in fiscal year 2013. How much of that money was allocated to EPA?

Ms. MCCARTHY. I can't answer that question, sir, but I am happy to follow it up.

Mr. WHITFIELD. OK. Do you know from the Secretary of Energy's position, Secretary Moniz, how much of the 22 billion——

Mr. MONIZ. Well, I think the problem, first of all, is how one counts. For example, if we count our energy efficiency programs, which of course have the objective of saving money and also——

Mr. WHITFIELD. OK.

Mr. MONIZ [continuing]. Would be part of the solution for climate change, well, then, let's add 1 billion there.

Mr. WHITFIELD. OK.

Mr. MONIZ. So if we talk about all the programs that are helpful for climate change——

Mr. WHITFIELD. Yes.

Mr. MONIZ [continuing]. Then we are talking about \$5 billion——

Mr. WHITFIELD. OK.

Mr. MONIZ [continuing]. Mostly in our R&D budget, but as I say, most of that is for, you know, efficiency, nuclear power——

Mr. WHITFIELD. Um-hum.

Mr. MONIZ [continuing]. Clean technologies, actually, we can throw in fusion. The one exception one might say is the substantial resources we devote to carbon capture and sequestration specifically to make coal competitive in a low-carbon world.

Mr. WHITFIELD. Thank you. My time is expired. I recognize Mr. Waxman for 5 minutes of questions.

Mr. WAXMAN. Secretary Moniz, in your testimony you describe the dangers we face from climate change. Is it too late to protect the planet from the worst effects of climate change?

Mr. MONIZ. Well, first of all, I think it is clear we cannot avoid implications. We are seeing them today. In my view this decade is the critical one that we need to move out smartly and smartly—

Mr. WAXMAN. How much time do we have?

Mr. MONIZ. Well—

Mr. WAXMAN. Can we afford to wait to act?

Mr. MONIZ. It will be a long-term commitment, but we have to act in this decade because, as I said, the CO<sub>2</sub> problem is cumulative and every ton we emit, you can check it off against our children and grandchildren.

Mr. WAXMAN. My concern is that we are facing this urgent threat, but all Congress is doing is getting in the way.

This Congress has rightly been called the do-nothing Congress. But on climate we are doing worse than nothing. We are affirmatively obstructing progress.

Administrator McCarthy, you have been accused of leading a war on coal. But in 2009 the President supported market-based legislation to make major carbon pollution reductions while investing \$60 billion to develop clean coal technologies like carbon capture and sequestration, isn't that right?

Ms. MCCARTHY. That is my understanding.

Mr. WAXMAN. The chairman said that this is the only country in the world where new coal plants cannot be built. You haven't released any regulations to prevent coal plants from being built, have you?

Ms. MCCARTHY. We have not, no.

Mr. WAXMAN. At the time, our bill was criticized for being too generous to the coal industry. But virtually all the Republicans on this committee and the coal industry opposed the legislation despite its massive investment in that industry. We wanted to invest in innovative approaches so that coal could still be used, but Republicans opposed us.

Last year, I tried a different approach. I wrote an op-ed calling for an emissions fee that would put a price on carbon. I even said that I would support using the revenues raised to reduce other taxes. But Republicans in the House also opposed this approach. Republicans outside the House, some of them, supported it. In fact, House Republicans opposed every idea that has been raised for addressing climate change.

Administrator McCarthy, you promulgated regulations last Congress reducing carbon pollution from cars and trucks. House Republicans voted to strip you of the authority to regulate those emissions, isn't that right?

Ms. MCCARTHY. That is my understanding.



Mr. WAXMAN. They also voted to strip EPA of authority to regulate carbon pollution from power plants, isn't that right?

Ms. MCCARTHY. That is right.

Mr. WAXMAN. Secretary Moniz, I have heard some Republicans say that they like the idea of energy efficiency. But when I look at their record, they voted to block enforcement of requirements for energy-efficient light bulbs and they have reported a budget for your department for next year that would cut funding for energy-efficiency programs. The same is true for investments in research to develop the solar, wind, and other clean energy technologies of the future.

Secretary Moniz, within your department there is a division called ARPA-E, which invests in advanced energy research projects. It is widely praised by the scientific and research communities for finding breakthrough technology. Yet this year, the House Appropriations Committee voted to slash its budget by over 80 percent, isn't that right?

Mr. MONIZ. Yes, that is correct, sir.

Mr. WAXMAN. In this committee I often hear Republican members argue against U.S. efforts to do anything about reducing emissions because our Nation would be at a competitive disadvantage. They say we need a global approach.

But then the House Appropriations Committee votes to defund the U.N. Framework Convention on Climate Change, which is the international body charged with negotiating an international climate treaty. Last Congress, House Republicans also voted to defund not only our international efforts but defund our government's lead climate negotiator.

Add it all up, what do you have? House Republicans have voted against climate change legislation, they voted against climate regulation, they have voted against climate research and development, and they voted against international climate efforts.

It is an appalling record. And it is why my question to them is, What is your plan? It is easy to criticize other people's solutions. But if all you do is criticize, you are either a climate denier because you don't think anything needs to be done, the science doesn't warrant it, it is not happening, or they are ignoring the warning of scientists. Secretary Moniz told us that we have a very narrow window to act. We should be starting to act now, and that is why we need to stop ignoring the scientists and start listening to them, Mr. Chairman.

So tell us what your plan is, don't just criticize, because we are facing a serious problem not for the future but right now with extreme weather events.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentleman from Michigan, Mr. Upton, for 5 minutes.

Mr. UPTON. Well, thank you, Mr. Chairman.

You know, I think that it is important as we conduct oversight of agency actions on climate change and energy that we also reflect on the statutory frameworks of the agencies implementing such policy. And as an example, a point that I like to make is, as we reflect back on DOE's energy coordination role, it was developed frankly back at the time of energy constraints, way back in the

1970s. I think you would agree, Dr. Moniz, that we are currently in a new era of North American energy abundance. Now, where I believe, and I think the stats will show that as well, that we can actually be energy independent for North America by using all of our resources that are available. And I would like you to comment on that as part of the record.

Mr. MONIZ. And certainly, Mr. Chairman, the President and I both are very supportive of all-of-the-above energy strategy within a world where we are working to reduce CO<sub>2</sub> emissions.

Mr. UPTON. And I know on page 10 of the President's Climate Action Plan, the natural gas bullet, it refers to natural gas as a bridge fuel. And is it the policy of DOE to consider natural gas as a bridge fuel?

Mr. MONIZ. Well, our policy is to do what we can to support clean, safe production of natural gas, and I might add also of so-called unconventional oil.

Mr. UPTON. So as we look at what you may be doing as an agency to approve or consider export applications for LNG, is it bridge fuel? Is that part of the discussion or the debate?

Mr. MONIZ. No, sir, that has not been part of the discussion to date. I mean our approach to the LNG exports is by law to approve them unless we rule an application as not in the public interest. A public interest determination has many facets. We have just given, as you know, another two applications conditional approvals recently. I should emphasize that the final approval will require the environmental review through FERC and then coming back to the Department of Energy.

Mr. UPTON. I just know as I look at the situation, particularly as we try to become North American energy independent, the new discoveries and fields that we have been able to find of natural gas are an exciting, positive change. We look at the advent of the manufacture of vehicles, passenger vehicles perhaps using natural gas. We look at some of the large fleets some of our businesses, whether they be UPS or AT&T and others being able to convert those vehicles to natural gas. I have a major manufacturer in my district, Eaton, which is looking at natural gas trucks for their fleet. We even look at locomotives, our railroads, looking at perhaps a very positive transition from diesel to natural gas and the work of, I know, Caterpillar and General Electric producing those and seeing if in fact it will have a very positive impact on our economy and to real change.

Ms. McCarthy, does EPA consider natural gas abundance as a bridge fuel?

Ms. MCCARTHY. EPA views natural gas abundance as a positive for air quality as an opportunity for us domestically to be safe and secure in our energy supplies. Our responsibility is to ensure that that is done as safely and responsibly as we can working with the industry.

Mr. UPTON. You know, one of the concerns that I hear, particularly as I talk to the railroad folks and they are looking at this potential change conversion to natural gas is that they are concerned as they look at purchasing these, if in fact they work, that the regulations may change, thus impacting the "payback period" as it relates to the—is EPA considering new regulations to do that?

Ms. MCCARTHY. Any regulations that EPA would consider are going to be thoughtfully proposed and commented on. Right now, sir, I think it is safe to say that EPA is investing very heavily in opportunities to understand the sector, to gather data, to work with the industry in a collaborative way. We see this as a very positive collaboration moving forward. We see this as a significant opportunity to reduce air pollutants and to move forward in a safe and effective domestic supply. And so I am very encouraged about the relationship we are building with the gas industry, the rules we have already put out. I see no reason for concern that that situation is going to change and people won't be able to rely on this as a cleaner fuel moving forward.

Mr. UPTON. Thank you. I know my time is expired.

Mr. WHITFIELD. The gentleman's time is expired. At this time, I recognize—

Mr. MONIZ. Mr. Chairman, may I just add a footnote with your permission?

Mr. WHITFIELD. Yes, sir.

Mr. MONIZ. I just want to say to Chairman Upton I would add to your list marine applications, and also in fracking, replacing diesels with natural gas engines there as well, less oil use and better air quality.

Mr. WHITFIELD. Thank you, Mr. Secretary.

At this time I recognize the gentleman from California, Mr. McNerney, for 5 minutes.

Mr. MCNERNEY. Thank you, Mr. Chairman.

I would like to explore two things in my 5 minutes. First is the confidence that you have that climate change is taking place as a significant threat and as caused by a large degree by human activities; and secondly, if actions taken to combat climate change will harm or benefit the economy. So, first, Secretary Moniz, would you address the first question? How confident are you that climate change is taking place, that it is a significant threat, and that it is caused to a large degree by human activity?

Mr. MONIZ. Well, again, first of all, of course the scientific community overwhelmingly endorses those statements and I personally do. As I have said in a previous hearing for this committee, I think my confidence in those statements does not rely just on the results of some very complicated computer models but some very simple arithmetic in terms of what has been known for a long time about the strength of CO<sub>2</sub>, the greenhouse effect, and that the amount that we are emitting is of the scale that within decades we would reach areas such as doubling preindustrial emissions, which have always been viewed as being highly, highly risky.

Mr. MCNERNEY. Thank you. Administrator McCarthy, I would like to address my second question to you in this form: How have higher standards such as those as fuel efficiency helped drive innovation and create jobs?

Ms. MCCARTHY. Well, we have been working with the auto industry in particular over the past few years to understand what they need to have certainty moving forward on air quality standards, on fuel efficiency, on greenhouse gas standards. We have worked together. And as a result of our rules, we have been able to support the industry in a robust sort of reemergence of that industry both

domestically and internationally. We are proud of the work we have done together. We are delivering fuel-efficient vehicles for consumers in the way they want them. We are saving them money. We are reducing greenhouse gases. And we believe we are part of the auto industry's efforts to gain a competitive advantage that is to a great advantage for jobs and economy in this country.

Mr. MCNERNEY. So you believe the Detroit has become more competitive with these higher fuel standards—

Ms. MCCARTHY. We believe so.

Mr. MCNERNEY [continuing]. Thereby creating more jobs?

Ms. MCCARTHY. We know that certainty is important moving forward. We have provided this industry a path forward until 2025. That gives them an opportunity to do research, to develop new technologies, and to have a solid footing moving forward.

Mr. MCNERNEY. Thank you.

Mr. MONIZ. If I may just add—

Mr. MCNERNEY. Sure.

Mr. MONIZ [continuing]. Sir, on the auto side, I think it is actually even a bigger story going back to when the auto industry in this country looked like it was on its last legs, a whole combination of issues from support for GM and Chrysler assuming they had proper restructuring for the future, to loan guarantees for Ford and Nissan; Nissan built a plant in Tennessee because of that loan guarantee—to preparing for the future with electric vehicle markets and the great success story of Tesla, we could talk about Fisker, which we all know is a different issue today, but overall, this portfolio has taken us to an incredibly vibrant auto industry that is growing faster than the Chinese auto industry.

Mr. MCNERNEY. Are there any other technologies or items that energy efficiency or work toward renewable energy has created jobs that you would like to point to?

Mr. MONIZ. Certainly. We could go through lots and lots of those stories. First of all, on again the autos, Tesla is a story of 3,000 jobs in California. That is way above even their business plan. Take the solar PV business and I will go back to our loan guarantee program. When there was no debt financing available, those loans supported the first six utility-scale PV projects in this country. There have subsequently been 10 with pure private financing. That is jobs all the way from manufacturing, to supply chain, to the installation and operation.

Mr. MCNERNEY. Well, do you see grid modernization playing a role in helping reduce climate change and also in creating jobs?

Mr. MONIZ. Grid modernization is a very, very high priority. It has multiple benefits. One would be the integration of renewables into the system. A second is that it can provide with intelligence embedded in the grid. It can provide new consumer services and higher efficiency, lower bills. And finally, it will be needed, as the example I gave in New Jersey, to provide resilience against the extreme weather events that we are seeing more and more of.

Mr. MCNERNEY. Well, thank you. I yield back, Mr. Chairman.

Mr. WHITFIELD. Thank you.

At this time I recognize the gentleman from Texas, Mr. Barton, for 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman.

I want to welcome our two witnesses and give you the red badge of courage for showing up. We invited 13 agencies and I don't know if you all drew straws and got the long straws or whatever, but you two are here and we are glad you are here. We didn't hear from Department of Agriculture, Defense, HHS, Interior, State Department, Transportation, Export-Import Bank, NASA, National Oceanic Atmospheric Administration, Office of Science and Technology Policy, or U.S. Agency for International Development. For some reason they couldn't make it, but you two are and you all have been here before and we are glad you all are both here.

Each of you and the other 11 agencies got a letter dated August the 6th, 2013, asking you to attend, and it asked you to answer nine questions. Now, when Mr. Waxman was speaking in his Q&A he said that the Obama administration has spent about \$60 billion on climate change. The number I had was 70 billion, but we will go with Mr. Waxman's 60 billion number. And this is really an effort to let the Obama administration put their best foot forward. So we asked nine questions and I asked the staff if your agencies had answered these questions. And I am told that they had not. So I am going to read them into the record and then give each of you briefly a chance to see if you can get us these answers.

The first question that we asked your agency was to describe the climate change-related research and technology programs that you are actively engaged in, including programs or activities undertaken with other Federal agencies. We didn't get an answer to that.

We asked you to describe the climate change adaptation, mitigation, or sustainability-related activities engaged in, including activities undertaken with other Federal agencies. We didn't get an answer to that.

We asked you to identify all the climate change-related inter-agency task forces, advisory committees, working groups, and initiatives in which your agency is currently participating and or has participated in since January of 2005, didn't get an answer to that.

We asked you to identify all climate change or clean energy-related funding, grants, or financial assistance programs which your agency is currently participating or has participated in and the amount of climate change or clean energy-related funding, grants, and financial assistance distributed by your agencies since January of 2005, didn't get an answer to that.

We asked you to identify all the climate change-related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions issued or proposed by your agency since January 2005 or under development, didn't get an answer to that.

We asked you to identify all the climate change-related international negotiations, agreements, partnerships, working groups, or initiatives in which you currently or have previously participated since January 2005, didn't get an answer to that.

Provide the approximate amount of annual agency funding attributed to climate change activities of the fiscal years 2005 through 2012, didn't get an answer to that.

Describe the actions that your agency has undertaken to respond to the Executive Order by the President, 13514, including the approximate cost, personnel, and other resources dedicated by your

agency to implement that Executive Order, didn't get an answer to that, Mr. Chairman.

And last but not least, to provide a list of each sub-agency, division, and/or program office within your agency that is currently engaged in climate change-related activities and to provide an estimate of the approximate number of your agency employees and/or contractors engaged part-time or full-time in climate change-related activities. Guess what, didn't get an answer to that.

Now, Mr. Waxman has been asking this committee and the subcommittee to hold hearings on President Obama's climate change efforts all year long. We asked nine questions. We didn't get one straight answer. Are you trying to hide something? Are you embarrassed by it? Or you just don't care to respond to the Congress?

Mr. MONIZ. Well, I will answer first at least, Mr. Barton. Thank you.

Look, I am very happy to come and discuss any and all of those questions. I will address a few of them now if you would like. Certainly, well, for the Department of Energy, for example, the question on regulations, et cetera, standards, that is clear. It is efficiency standards is what we do in this regard.

In terms of the programs, as I said earlier, I would say our last budget, fiscal year 2013 enacted, the question is ambiguous, but if we take all of the programs that help address climate change, even if they have other objectives like efficiency, then that count would come to about 5.4 billion. But as I say, there are multiple objectives. There is fuel diversity, nuclear energy, fossil energy, et cetera.

Mr. BARTON. Well, my time has expired.

Mr. MONIZ. OK.

Mr. WHITFIELD. And I think, Mr. Secretary, we do appreciate your making an effort to answer, but I do hope that you all would get with your staffs and try to respond to us because, as was indicated, we asked these questions—

Mr. MONIZ. We will do that, sir.

Mr. WHITFIELD [continuing]. Some time ago and we would appreciate you all responding to that.

Mr. BARTON. Mr. Chairman, the point I am trying to make is we are trying to have a good faith effort here to have a real dialogue, but in order to have the dialogue, we have to have the facts. And we are being stonewalled, which means the American people are being stonewalled. These are not complicated questions and they are not trick questions. If the Obama administration has this great Climate Change Action Plan, every one of these questions should be able to be answered in detail and in glowing terms. So I would hope that you two representatives of the Obama administration, you know, first of all, both of you are good people. You are smart, you have got integrity, you have worked with this committee. Get us the straight facts and then we will have a debate with the other side—

Mr. WAXMAN. Will the gentleman yield?

Mr. BARTON [continuing]. Over what those facts mean.

Mr. WAXMAN. Mr. Barton, will you yield to me just to correct a statement—

Mr. BARTON. If I have time, I will be happy to yield.

Mr. WAXMAN. Well, you quoted me as saying the \$60 billion has been spent, but my statement was that we proposed \$60 billion to go to be spent under our legislation. Secondly, it is unprecedented to have to Cabinet-level officials who have the primary burden of dealing with the climate change issue come before a subcommittee. I hardly call that stonewalling.

Mr. WHITFIELD. Actually, CRS said 70 billion over the last 4 years but—

Mr. WAXMAN. Well, we are talking about different—he quoted me as saying 60 billion. I wasn't saying it was 60 instead of 70. My statement about 60 billion was what we proposed to spend in the cap-and-trade bill.

Mr. WHITFIELD. At this time I would like to recognize the gentleman from Michigan, the distinguished gentleman, Mr. Dingell, for 5 minutes.

Mr. DINGELL. Mr. Chairman, I thank you for your courtesy.

Administrator McCarthy, welcome back to the committee and congratulations on your new position as EPA Administrator.

Ms. MCCARTHY. Thank you.

Mr. DINGELL. We wish you great good luck as you take on this new position.

And also, Mr. Secretary, we welcome you to the committee.

Gentlemen and ladies, these questions will be yes or no and I will request that you give us some additional information as a response after the response has been made.

So for both of our witnesses, does EPA or the Department of Energy see a future for coal as a viable energy source in light of the impending greenhouse gas regulations? Please answer yes or no and then submit additional information for the record.

Ms. MCCARTHY. Yes, Congressman.

Mr. MONIZ. I agree. Yes. Um-hum.

Mr. DINGELL. Now, Administrator McCarthy, I understand that there will be a different proposal for modified sources, i.e., units that have been updated, and also for existing sources that have not been modified. Can you tell me if EPA is reaching out to all stakeholders concerned about both components of the greenhouse gas rule? Please answer yes or no.

Ms. MCCARTHY. To the best ability we can, yes, we are.

Mr. DINGELL. Would you please also, Madam Administrator, submit more information for the record?

Now, is EPA thinking about a unit-by-unit compliance goal for the existing and modified source carbon standards? Please answer yes or no.

Ms. MCCARTHY. We are thinking about that and a number of other different flexible strategies.

Mr. DINGELL. Would you submit such additional comments for the record as you deem appropriate?

Ms. MCCARTHY. Yes, sir.

Mr. DINGELL. Now, the debate about climate change is not just about air but it is also about water. I am sure that both you and the Secretary understand this.

Administrator McCarthy, you do all know that the Great Lakes contain 20 percent of the world's freshwater. Luckily, our water levels are up slightly this year after years of inadequate ice cover

on the lakes and too little precipitation, rain and snow. Lower lake levels affect not only shipping and boating and recreation but also make it easier for algae blooms to form, endanger fish habitats, and threaten drinking water sources, as well as industrial and cooling water intakes. Madam Administrator, do you believe that the President's Climate Action Plan provides the direction for EPA to deal with the unique problems of the Great Lakes? Please answer yes or no.

Ms. MCCARTHY. Yes.

Mr. MONIZ. Sir, may I—

Mr. DINGELL. Will EPA under your leadership continue to work with other Federal and State agencies to address climate-related problems on the Great Lakes? Yes or no?

Ms. MCCARTHY. Yes.

Mr. DINGELL. In dealing with water quality, do you believe that EPA has adequate clarification of its jurisdiction under the Clean Water Act to ensure protection of water sources? Please answer yes or no.

Ms. MCCARTHY. Not as yet but we are certainly working on that.

Mr. DINGELL. I want you to give us some additional response on that because that is a matter of deep concern, I think, to you, and it is to me, too.

Now, Madam Administrator, as these problems on the Great Lakes become more frequent, do you believe EPA will need further clarification of its Clean Water Act jurisdiction? Please answer yes or no.

Ms. MCCARTHY. Yes, I do.

Mr. DINGELL. And I believe you are finding, Madam Administrator, that the actions taken by the Congress to foreclose you and EPA from getting us additional work in terms of rules and regulations clarifying the Supreme Court decision are extremely unhealthy, am I correct? Yes or no?

Ms. MCCARTHY. We find them very difficult.

Mr. DINGELL. Now, I am sure you have seen a recent map published in the National Geographic showing what would happen if all the world ice were to melt. While this is a somewhat drastic scenario, it shows almost all of Florida and all of New Jersey submerged. It was not the map, however, that intrigues me most. The map showed little or no effect on the Great Lakes. Do you believe that EPA along with other Federal agencies have the tools necessary to predict what affects climate change might have on the Great Lakes basin and the region in which they exist? Please answer yes or no.

Ms. MCCARTHY. Yes.

Mr. DINGELL. Would you submit additional information for the record as you deem it appropriate?

Ms. MCCARTHY. I will.

Mr. DINGELL. Now, I would like to have a submission from you, Mr. Secretary, about what it is you are going to do about potential shortages and whether we have shortages coming on electric power because of the actions that are going to have to be taken with regard to global warming and matters of that kind and how that is going to affect our future in terms of the reliability and availability of electric power.



And I thank you, Mr. Chairman.

If you would submit that for the record, please.

Mr. MONIZ. And I will just note, sir, that we have a report of vulnerabilities of the energy infrastructure that will answer many of your questions. I might just add one factoid that there are projections that in an unconstrained world in terms of greenhouse gas emissions, we could see about a 2-foot drop in the level of the Great Lakes in this century, which would of course be very, very disruptive.

Mr. DINGELL. Industry is going to make a large number of retirements of plans because of—

Mr. WHITFIELD. The gentleman's time is expired.

Mr. DINGELL. I thank you, Mr. Chairman.

Mr. WHITFIELD. At this time I recognize the gentleman from Texas, Mr. Hall, for 5 minutes.

Mr. HALL. Mr. Chairman, thank you very much.

And the argument about whether or not climate change is taking place, I know one thing by the argument that Mr. Barton had with the gentleman from California, something that is taking place and taxing the hard-working people of this country is taking place.

And, Mr. Chairman, thank you for your opening statement when you set out, and it wasn't an estimate on your part. This is from the Congressional Research Service—they usually are pretty accurate—that the climate change funding for climate science technology, international assistance, and adoption was approximately 70 billion for the period 2008 to 2012.

Now, Mr. Barton, you got better answers. I counted, I think, 12 or 15 of those people that didn't give you any answer at all. By no answer you got a better answer than I had received from Mrs. McCarthy about a year ago in the Science Committee if you remember coming before our committee there. And I may have asked you a question you didn't like and your answer was I am not in the business of creating jobs. That is out of the record itself. And I left word there if you wanted to apologize to the many millions of people that were unemployed and many of them hungry. And I have never seen that apology to this day.

Actually, Mr. Chairman, I would like to ask unanimous consent to submit more of my questions in writing. I have more than the 5 minutes lets me make here.

Mr. WHITFIELD. Without objection.

Mr. HALL. That is taking place at 20 billion per year and we can figure that up however we want to. And I yield back the time. I thank both the witnesses for appearing.

Mr. WHITFIELD. The gentleman yields back the balance of his time.

At this time I would recognize the gentleman from New York, Mr. Tonko, for 5 minutes.

Mr. TONKO. Thank you, Mr. Chair.

Secretary Moniz, if we were going to reduce our carbon pollution, we need to deploy more clean energy and boost energy efficiency. Yesterday, the Department of Energy released its report showing that wind and solar power, LED lighting, and electric vehicles are growing rapidly in this country as a result of well-designed Federal and State incentives and investments in research and development.

That being said, the report finds that as a result of these measures, “the historic shift to a cleaner, more domestic, and more secure energy future is not some faraway goal. We are living it, and it is gaining force.” I would like to ask unanimous consent to enter this report into the record, Mr. Chair.

Mr. WHITFIELD. Without objection.

[The information follows:]

# Revolution Now

---

The Future Arrives for Four Clean Energy  
Technologies

September 17, 2013



**Lead author**

*Dr. Levi Tillemann, Special Advisor for Policy and International Affairs*

**Contributors**

*Fredric Beck, DOE Wind Technology Program*

*Dr. James Brodrick, DOE Solid-State Lighting Program*

*Dr. Austin Brown, DOE National Renewable Energy Laboratory*

*David Feldman, DOE National Renewable Energy Laboratory*

*Tien Nguyen, DOE Fuel Cells Technology Office*

*Jacob Ward, DOE Vehicles Technology Program*

Gaining Force .....	1
U.S. Land-Based Wind Power.....	2
Wind deployments on a steep upward climb.....	2
Skyrocketing demand, downward trending prices.....	3
The future of wind .....	3
Solar PV .....	4
A generational shift.....	4
99% cheaper.....	4
A bright future.....	5
LED Lighting.....	6
Plenty of light, but not much heat .....	6
More choice, lower cost .....	7
A solid investment .....	7
Electric Vehicles .....	8
Accelerating deployment.....	8
A race to the clouds .....	8
Road to the future.....	9
Conclusion.....	10

---

## Gaining Force

For decades, America has anticipated the transformational impact of clean energy technologies. But even as costs fell and technology matured, a clean energy revolution always seemed just out of reach. Critics often said a clean energy future would “always be five years away.”

This report focuses on four technology revolutions that are here today. In the last five years they have achieved dramatic reductions in cost<sup>1</sup> and this has been accompanied by a surge in consumer, industrial and commercial deployment. Although these four technologies still represent a small percentage of their total market (e.g. electricity, cars and lighting), they are growing rapidly.

The four key technologies this report focuses on are:

- Onshore wind power
- Polysilicon photovoltaic modules
- LED lighting
- Electric vehicles

In recent years, it has become increasingly clear that well-designed federal and state incentives and investments in research and development have the potential to stimulate significant energy transformations. For instance, from 1980-2002 the U.S. federal government’s production incentives for shale gas and support for new drilling technologies laid the foundation for that industry’s dramatic rise.<sup>2</sup> Today, time-limited tax credits for wind, solar and electric vehicles and targeted support for research and development are supporting the expansion of these burgeoning markets.

This analysis explains both the magnitude of and mechanisms behind these nascent revolutions – exploring the intersection between declining costs and surging demand. These industries are providing real world solutions for reducing emissions of harmful carbon pollution and slowing the effects of climate change. Each of the sectors examined has also become a major opportunity for America’s clean energy economy.

The trends in each sector show that the historic shift to a cleaner, more domestic and more secure energy future is not some far away goal. We are living it, and it is gaining force.

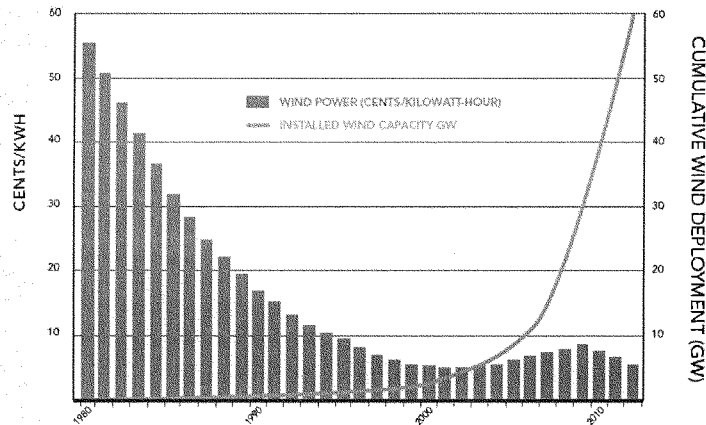
---

<sup>1</sup>Levelized cost is often cited as a convenient summary measure of the overall competitiveness of different generating technologies. It represents the per-kilowatt hour cost (in real dollars) of building and operating a generating plant over an assumed financial life and duty cycle. Key inputs to calculating levelized costs include overnight capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate for each plant type. As with any projection, there is uncertainty about all of these factors and their values can vary regionally and across time as technologies evolve and fuel prices change. See the Energy Information Administration’s *Annual Energy Outlook 2013* for a deeper discussion regarding these issues: [http://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](http://www.eia.gov/forecasts/aeo/electricity_generation.cfm)

<sup>2</sup> Moniz, E. et al; *The Future of Natural Gas: an interdisciplinary MIT Study*, MIT, June, 2011.

## Land-Based Wind Power

Deployment and Cost for U.S. Land-Based Wind  
1980-2012



### Wind deployments on a steep upward climb<sup>3</sup>

Today, deployed wind power in the United States has the equivalent generation capacity of about 60 large nuclear reactors.<sup>4</sup> Wind is the first non-hydro renewable energy source to begin to approach the same scale as conventional energy forms like coal, gas and nuclear.

This success has been decades in the making – with both government and private-sector R&D dollars propelling its progress. From a technology standpoint three elements have been key to wind power's success. The first is increasing size: wind turbines have gotten progressively larger in terms of generation capacity over the past 30 years and this has helped to drive down costs. In fact, since 1999 the average amount of electricity generated by a single turbine has increased by about 260%. The second is the scale of production. As with many industries, increases in scale tend to drive down costs. Finally, wind farm

<sup>3</sup>Bolinger, Mark; Wiser, Ryan. *MEMORANDUM - Documentation of a Historical LCOE Curve for Wind in Good to Excellent Wind Resource Sites*; Lawrence Berkeley National Laboratory, June 11, 2012. Bloomberg New Energy Finance power plant database (1980-1994) and American Wind Energy Association wind industry database (1994-2012).

<sup>4</sup> This number refers to "nameplate capacity" which represents the peak generation capacity of a wind turbine, solar panel, etc. In practice, electricity generation from renewable resources is variable – which means that they do not always produce at nameplate capacity. See the Energy Information Administration's Annual Energy Outlook 2013 for a deeper discussion regarding these issues: [http://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](http://www.eia.gov/forecasts/aeo/electricity_generation.cfm)

operators have become much more sophisticated in understanding and adapting to dynamic wind patterns. This has helped drive up the “capacity factor” – or the percentage of time that turbines are actually producing electricity. The federal Production Tax Credit – which pays an additional 2.3¢ a kilowatt hour for the electricity produced by wind turbines over the first 10 years of operation – has also been critically important to incentivizing deployment of wind energy.

### **Skyrocketing demand, downward trending prices**

Since the beginning of 2008, wind power capacity has more than tripled in the U.S. This has happened despite a jump in wind turbine costs from 2001 to 2009. But that rise in turbine prices is, in some senses, misleading. The cost to install the same sized turbine, in an area with the same level of wind resource has gone down. However, as more of the prime real estate for building wind farms – windy terrain near power lines and big cities – is populated by wind turbines, developers have moved to areas that are farther away from population centers and power lines, or have lower wind quality. To compensate for lower wind speeds, many turbines are manufactured with bigger blades – to catch more wind. These bigger blades are more expensive, and this increase in costs was accentuated by the steep climb in commodity prices (e.g. steel and oil) from 2004-2008. But as commodity prices have receded, the average cost of new wind power has also started to recede, and deployment of wind turbines has skyrocketed. In 2012, the U.S. deployed almost twice as much wind as it did in 2011. In fact, wind accounted for 43% of new electrical generation capacity in the U.S. – more than any other source.

### **The future of wind**

Wind continues to be one of America’s best choices for low-cost, zero carbon, zero pollution renewable energy. The combined potential of land-based and off-shore wind is about 140 quads – or about 10 times U.S. electricity consumption today. And wind is 100% renewable, so it won’t ever run out. The industry is working to build new power transmission lines from some of the windiest parts of the country, to the most densely populated in order to maintain aggressive growth in the sector. This also includes building “marine” wind farms offshore – where steady ocean breezes harbor vast wind power potential. With continued technology improvements and policy support, the Department of Energy estimates that as much as 20% of projected U.S. electricity demand could be met by wind power by 2030.<sup>5</sup>

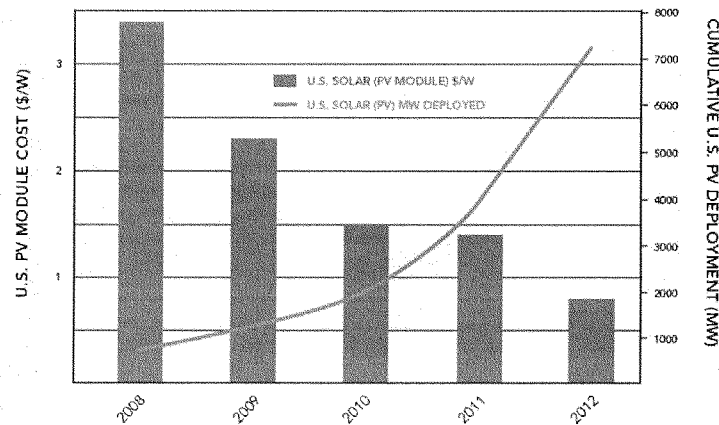
---

<sup>5</sup> U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. *2012 Wind Technologies Report*; U.S. Department of Energy, 2012. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. *20% Wind Energy by 2030: Increasing Wind Energy’s Contribution to U.S. Electricity Supply*, July 2008



## Solar PV

U.S. Deployment and Cost for Solar PV Modules  
2008-2012



### A generational shift

Although the energy potential of the sun is, for practical purposes, limitless, the cost of converting that energy into usable electricity has traditionally kept solar PV out of reach for all but a few niche applications – such as powering cell phone towers in remote terrain, warning beacons on offshore oil rigs and in space. But today we are in the midst of a generational shift to solar energy. Falling costs for solar power mean that the infinite power of the sun is increasingly within reach for the average American homeowner or business. This shift has come about because of a dramatic retreat in the price of solar PV modules – a trend that has accelerated over the past 5 years. Today, solar PV is rapidly approaching cost parity with traditional electrical generation from gas, coal and oil in many parts of the world, including parts of the U.S.

### 99% cheaper

In 2012, rooftop solar panels cost about 1% of what they did 35 years ago,<sup>6</sup> and since 2008, total U.S. solar PV deployment has jumped by about 10 times – from about 735 megawatts to over 7200 megawatts.<sup>7</sup> During that same time span the cost for a PV module has declined from \$3.40/watt to

<sup>6</sup> Mints, Paula. *The Global Market for PV Technologies*, Solar PV Market Research, 2012.

<sup>7</sup> Ibid. *Photovoltaic Manufacturer Shipments, Capacity & Competitive Analysis 2011/2012*; Palo Alto, CA, Navigant Consulting Photovoltaic Service Program, 2013.

about \$0.80 /watt, and this has catalyzed a rush in solar deployment.<sup>8</sup> While part of this is due to oversupply in the global PV market, a good portion is also due to advances in technology and increased economies of scale.

Historically, a doubling in industry capacity for solar PV manufacturing has correlated with about a 20% decline in PV prices. As more and more solar panels are built and deployed, costs have fallen. A federal “investment tax credit” equal to 30% the cost of rooftop PV systems has helped this process along. Local incentives for PV deployment in the U.S. – as well as the E.U., Japan, China and other countries – have also helped to push solar manufacturing progressively further down the cost curve.

### A bright future

The cost of installing a solar PV system includes not only the price of the actual PV module, but permitting and installation costs as well – what the industry calls “soft costs.” As the cost of PV modules has come down some of the best opportunities to bring down the price of solar energy are now reductions in these “soft costs.” For example, the soft costs for installing a rooftop solar panel in the U.S. are about five times higher than in Germany (\$3.34 per watt in the U.S. vs. \$0.62 per watt in Germany).<sup>9</sup> These “soft costs” are lower for utility scale solar and ultimately the competitiveness of residential PV also depends on local electricity prices.

Today, Americans are increasingly turning to the power of the sun, which allows them the security of generating their own, low-cost, electricity. Current trends indicate that solar energy has a very bright future.

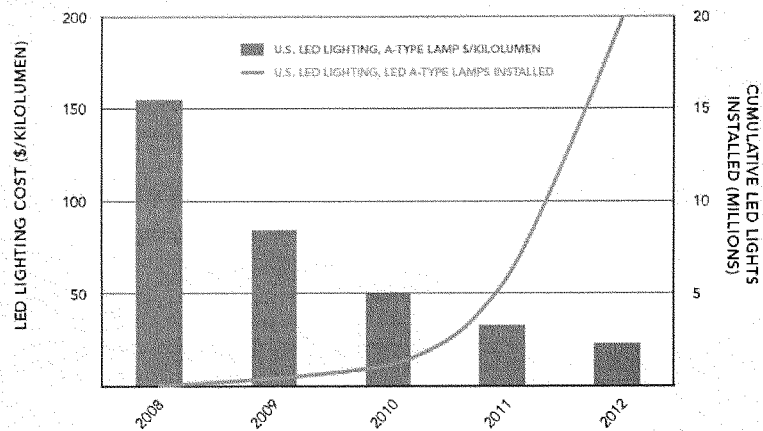
---

<sup>8</sup> Beyond module costs, PV system costs generally include other hardware costs such as inverters, racking, and wiring, as well as process and business soft costs including customer acquisition, permitting, inspection and interconnection, financing and contracting, supply chain, and margin.

<sup>9</sup> Seel, J.; Barbose, G.; Wiser, R. (2012). *Why Are Residential PV Prices in Germany So Much Lower Than in the United States?*; Berkeley, CA, Lawrence Berkeley National Laboratory, September 2012.

## LED Lighting

Deployment and Cost for A-Type LED Lights  
2008-2012



### Plenty of light, but not much heat

The argument for Light Emitting Diode (LED) lighting is easy to make: they provide plenty of light, but not much heat. An incandescent light bulb generates light exactly the same way Edison's bulb did 100 years ago: it heats a tungsten filament until it gets blazing hot—in excess of 400°F<sup>10</sup>—and that process produces light. However, about 90% of the energy used by an incandescent bulb is actually transformed into heat rather than visible light—which is why you can burn your fingers when changing a light bulb. In terms of energy use, the light we enjoy from incandescent bulbs is really a byproduct.

LED lighting flips this equation on its head. Because of this, a standard 60 watt incandescent light bulb can be replaced by a ~9 watt LED light that is 84% more efficient.<sup>11</sup> And although LEDs cost more up front, they also last as much as 25 times longer (1,000 hours vs. 25,000 hours).<sup>12</sup> Because of this, a mother who installs a quality LED fixture when her child is born will not need to change it until that child

<sup>10</sup> Lindgard, RD; Myer, MA; Paget, ML. *Performance of Incandescent A-Type and Decorative Lamps and LED Replacements*; Pacific Northwest Laboratory, November 2008.

<sup>11</sup> For one example, see the Cree Day Light 60-Watt Replacement, <http://www.cree.com/lighting/landing-page/~media/Files/Cree/Lighting/Lamps/Bulb/CreeBulbDataSheet.pdf>

<sup>12</sup> For more information see the web site for the U.S. Department of Energy L-Prize [http://www.lightingprize.org/about\\_ssl.stm](http://www.lightingprize.org/about_ssl.stm)

goes to college – or even graduates. Over that period, she could save over \$140 for every incandescent bulb she swaps for an LED.<sup>13</sup>

For many commercial facilities, the advantages go beyond energy saved. Changing hard to reach light bulbs is a hassle, and even dangerous. LED lighting solves this problem in a sleek, elegant, efficient package.

#### **More choice, lower cost**

Over the past five years, price reductions in LED bulbs have transformed the economics of the industry. Until recently, installing LED lighting didn't seem like such a bright idea for normal home lighting. They were not really powerful enough to replace a standard light bulb and even in 2012 would have cost perhaps \$50 a piece. At that price, LEDs were destined to remain a distinctly niche product. But today's LEDs are brighter, have better color quality and many cost less than \$15. This is making them an increasingly popular choice for Americans who want to reduce their lighting bills or simply don't want to deal with changing bulbs so often.

In 2009, fewer than 400,000 LED lights were deployed across the U.S. But by 2013, deployment had grown over 50X to nearly 20 million – almost all of these in applications that would have once utilized energy-intensive incandescent bulbs.

#### **A solid investment**

For more than a decade, the Energy Department has funded research and development of LED lighting. During the American Recovery and Reinvestment Act, the Department of Energy also made significant investments in manufacturing to help bring down the price of LEDs.

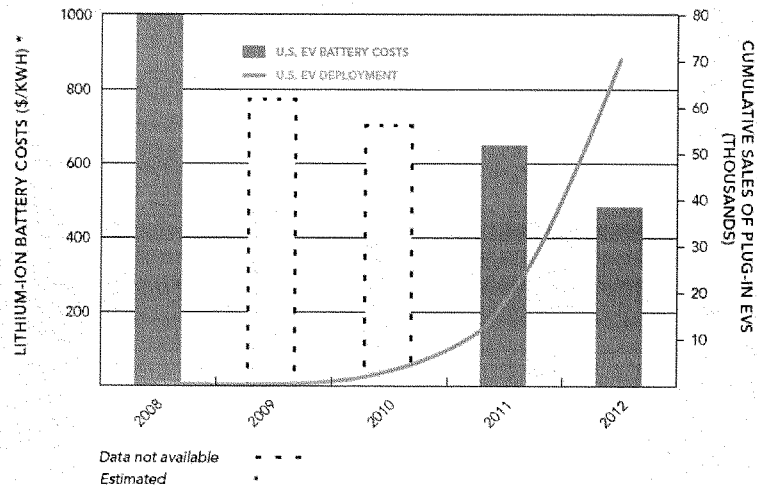
Today, America is on the verge of reaping the rewards of these years of investment. The Energy Department's Office of Energy Efficiency and Renewable Energy projects that by 2030, LED lighting will save Americans over \$30 billion a year in electricity costs and cut America's energy consumption for lighting in half. As prices continue to decline, LED lighting products will become increasingly competitive and attractive to Americans. This will mean big reductions in carbon pollution, lower energy bills and a more secure energy future for America.<sup>14</sup>

<sup>13</sup> Based on a national electricity cost of 12 cents per kilowatt hour. See <http://www.usa.philips.com/c/energy-saving-light-bulbs/23285/cat/en/>

<sup>14</sup> U.S. Department of Energy, Energy Efficiency and Renewable Energy. *Energy Savings Potential of Solid-State Lighting in General Illumination Applications*. U.S. Department of Energy Solid-State Lighting Program, January 2012. Available at: [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl2012\\_energysavings\\_factsheet.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl2012_energysavings_factsheet.pdf)

## Electric Vehicles

Deployment and Cost for Electric Vehicles and Batteries\*  
2008-2012



### Accelerating deployment

Electric cars run on cheap, clean and increasingly green American energy. Over the past five years, the Administration and industry have worked together to bring down the cost of EVs through funding research and development on batteries and promoting consumer adoption of EVs through tax and other incentives. Today, the numbers are clear: more and more drivers are abandoning the gas pump for the affordability and convenience of in-home electric charging.

### A race to the clouds

Before 2010, U.S. EV demand was almost nothing. But in 2012, Americans bought more than 50,000 plug-in electric vehicles. In the first half of 2013, Americans doubled the number of EVs they purchased compared to the same period in 2012.

To maintain this momentum the most critical area for cost reductions is batteries. Energy Department models for EV battery fabrication costs show that the cost of high volume EV batteries has fallen by more than 50% in the past four years. While actual battery production costs are a closely held industry secret, price reductions in commercial EVs also appear to be on a steady downward glide. These cost reductions can be attributed to a number of factors. So-called “process improvements” – which increase the efficiency of manufacturing by eliminating wasted materials, capital and time – are one key element.

So is higher production volume – which helps amortize capital costs for expensive facilities, assembly lines and robots used to build batteries. Finally, automakers are integrating new materials into EV batteries that both reduce cost and increase energy-density – or the amount of energy that can be stored in a battery. Today batteries are receiving an enormous amount of attention from universities, research labs, industry and government because of their critical role in enabling EVs and other clean energy technologies. Because of this, we expect costs will continue to decline even further.

#### Road to the future

In many senses, EVs are already competitive with traditional cars. For instance, for three years in a row the Chevy Volt has topped JD Power's *APEAL Study* on consumer satisfaction for compact sedans. And this spring Consumer Reports said the Tesla Model S was the best car they had ever tested.<sup>15</sup> Fueling these cars is also cheap compared to filling up a gasoline-powered car. The Energy Department calls this cheap electric fuel an "eGallon," and today an eGallon – the amount of electricity it takes to drive an EV the same distance a standard car can travel on one gallon of unleaded gasoline – costs only about \$1.22. This is in large part because electric motors are about three times as efficient as combustion engines.

But further progress on reducing the cost of EV batteries will make these benefits available to a larger audience. Some private sector analysts have said that there is a relatively clear technology path to \$200/kwh for battery storage by 2020.<sup>16</sup> The Department is working with industry, academia and our own labs toward an even more aggressive goal of \$125/kwh by 2022. At that point, ownership costs for a 280-mile EV will be equal to a standard vehicle.<sup>17</sup> All around the world, automakers are competing feverishly to design and deploy the electric car of the future. Today America is leading that race and every year, more and more Americans are fueling their cars on cheap, clean, secure, American energy.

<sup>15</sup> *The Tesla Model S is our top-scoring car*, Consumer Reports, May, 2013

<sup>16</sup> Hensley, Russell; Newman, John; Rogers, Matt. *Battery Technology Charges Ahead*; McKinsey Quarterly, July 2012.

<sup>17</sup> For more information see the Department of Energy's *EV Everywhere Blueprint*, [http://www1.eere.energy.gov/vehiclesandfuels/electric\\_vehicles/10\\_year\\_goal.html](http://www1.eere.energy.gov/vehiclesandfuels/electric_vehicles/10_year_goal.html)

### Conclusion

As these and other clean energy industries continue to expand, so will the challenges and opportunities associated with transforming America's energy sector. Already utilities are beginning to wonder how they will support their current business models in the face of increased energy efficiency and cheap rooftop solar power. As EVs move beyond the market for "first adopters" and become a mainstream, America will have to invest in building a smarter, more robust electrical grid and an extensive network of EV charging stations.

Those challenges are emblematic of successes in these clean energy markets. Indeed, electric vehicles, solar PV, wind power and LED lighting are all on track to transform our economy for the better. They will clean up the air in our cities, reduce America's vulnerability to unstable international oil markets and help build an economy that is more competitive and more efficient.

The Energy Department's goal is to encourage these trends by providing performance targets, support for R&D, consumer education and targeted deployment assistance. With continued progress in critical renewable and energy efficient technologies like these, we can look forward to a future of clean, green, American-made energy. Already for some of these innovative technologies, that future is here today.

Mr. TONKO. Thank you. The report contained a particularly striking graph about the cost and deployment of wind energy in the United States. Wind capacity has skyrocketed in our country, and I believe the committee has that graph. OK. We are posting it on the screen. Thank you.

[Graph.]

Mr. TONKO. Secretary Moniz, what has been the key to wind power's success? As you see, we have the graph itself on the display screen.

Mr. MONIZ. Well, I think the story, as I alluded to earlier, it is actually the same story that we saw decades ago with unconventional natural gas. We had investment from the Federal Government, we had public-private partnerships, and we had time-limited, well-crafted incentive that has these things taking off. We are seeing the same thing now with wind. As we can see, the deployment is very, very striking. And of course the cost certainly in good wind areas are quite competitive with other sources.

The report has similar graphs, same kind of message, with photovoltaics. Solar energy, it is not fully appreciated how competitive solar is already in the right conditions, which is typical for this stage of a technology penetrating the market.

Mr. TONKO. So is the response for solar as strong as this wind?

Mr. MONIZ. Perhaps stronger.

Mr. TONKO. Super. What can we do to—

Mr. MONIZ. And also, if I may, in LEDs it is totally incredible. It has gone from, I don't know, 50,000 to 20 million deployed in the country in a very short time, and the cost has gone from \$50 to \$15 and the lifetime savings from one LED is over \$100.

Mr. TONKO. Thank you. What can we do to ensure that today's R&D is utilized fully into emerging energy technologies so that we can achieve these same levels of success?

Mr. MONIZ. Well, first of all, we need to, as I said earlier, we need a sustained commitment to maintain the research development demonstration and deployment push. That is absolutely required. And these will be market-competitive technologies again sooner rather than later.

The other thing is, of course, we would like to capture the full value of these developments and that involves other things that we are doing such as, for example, the advanced manufacturing partnership to really help establish the cutting-edge manufacturing capacity and training in this country.

Mr. TONKO. Um-hum. Energy efficiency is a key part of the President's Climate Action Plan. Energy efficiency is one of the cheapest and most cost-effective ways to reduce carbon pollution while saving consumers money, and it is a big part of the Department of Energy's responsibilities under the President's plan. Mr. Secretary, the President's plan calls for new energy efficiency standards for appliances and equipment. Why are energy efficiency standards a good way to reduce carbon pollution?

Mr. MONIZ. These standards apply to reducing all of our emissions, carbon emissions, as well as conventional pollutants by reducing the energy needs quite substantially. But I really want to emphasize all of our rules have a cost-benefit test and they also



save money for consumers. The upfront marginal increases are overwhelmed by the energy savings at the consumer level.

Mr. TONKO. Well, some believe that taking action to address climate change will kill jobs and cost consumers money. Is that an accurate description of these energy efficiency standards?

Mr. MONIZ. No, we believe that they create jobs for one thing by saving money in the economy that can be devoted to other purposes.

Mr. TONKO. Um-hum.

Mr. MONIZ. And in addition it gives us products that we can sell globally.

Mr. TONKO. Um-hum. I see that my time is up, Mr. Chair. I will yield back.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

Mr. SHIMKUS. Thank you, Mr. Chairman.

Again, welcome. I am glad to have both of you here today.

Secretary Moniz, any serious plan for reducing greenhouse gas emissions substantially must have a strong nuclear component. Do you agree with that?

Mr. MONIZ. I am sorry. Could you repeat that?

Mr. SHIMKUS. Nuclear power is critical and obviously having a greenhouse gas plan—

Mr. MONIZ. Yes, we are supporting nuclear power. Yes.

Mr. SHIMKUS. Do you consider nuclear programs to be a critical part of this administration's plan?

Mr. MONIZ. Yes, it is all of the above, and nuclear is strongly there.

Mr. SHIMKUS. So you probably weren't interested in following the last licensing case before the NRC and the only person who voted against licensing? That was the then-Chairman Jaczko, who was appointed by this President. So the concern is the conflicting signals we are seeing. You have got the presidential-appointed chairman of the NRC casting the only "no" vote for licensing a new nuclear power plant in this country. And so that leads to the other questions.

Under this administration how many nuclear reactors have closed down?

Mr. MONIZ. I believe there are five—

Mr. SHIMKUS. It is actually six. We have got one in New Jersey, Wisconsin, California, Florida, and Vermont.

Mr. MONIZ. And five being built.

Mr. SHIMKUS. Right, without the vote to license by the chairman of the NRC, who was appointed by the President. So I will give you that point, but you have to give me a point on jobs that a lot of jobs have been lost by the shutdown of these nuclear facilities.

Under the President's Climate Action Plan, EPA is expected to propose a rule later this week setting greenhouse gas standards for new power plants that will require CCS technologies for any new coal plant built in the U.S. This is effectively, as many of us fear and Administrator McCarthy knows where I stand on this, a ban on new coal-fired power plants. Do you believe, as the Secretary of Energy, that it is defensible for the EPA to impose regulations that

essentially ban the building of new coal-fired power plants in this country?

Mr. MONIZ. Well, I certainly am not going to comment on the ongoing—

Mr. SHIMKUS. But from an energy position of the baseload demand or the requirements of this country in low-cost power, obviously removing coal-fired power plants from the fleet will raise costs?

Mr. MONIZ. Again, our job at the Department of Energy is to—

Mr. SHIMKUS. Hopefully—

Mr. MONIZ [continuing]. Support the—

Mr. SHIMKUS [continuing]. Production of low-cost energy for our consumers—

Mr. MONIZ. Making technologies—

Mr. SHIMKUS [continuing]. And our manufacturers and the like.

Mr. MONIZ [continuing]. For coal in a low-carbon world. And I might add there is lots of activity already—

Mr. SHIMKUS. Well, we are going to keep following on that course of questions. Is the DOE aware of any U.S. commercial-scale power generation plant using coal as a fuel that captures, transports, and permanently stores carbon dioxide?

Mr. MONIZ. Well, as you know, there have been a number of demonstrations. There is the commercial—

Mr. SHIMKUS. That is not the question. The question is is there one today—

Mr. MONIZ. Commercial plant 75 percent complete and Mississippi—

Mr. SHIMKUS. But it is—

Mr. MONIZ [continuing]. And also although—

Mr. SHIMKUS [continuing]. Not generating and not storing.

Mr. MONIZ. But if I may add, it is not a power plant, but I think we should not ignore the fact—

Mr. SHIMKUS. That is another good point.

Mr. MONIZ [continuing]. That 12 years we have the Great Plains Weyburn project, 20 million tons have been used for EOR, and it is running on a commercial basis.

Mr. SHIMKUS. All right. The point, as you know, CCS takes billions of dollars. There is no commercially available technology to do it. It is not being conducted right now for—and I am going to turn to the administrator, who is a friend—but for these new rules to be promulgated, it is a signal that we are not going to build new coal-fired power plants until there is at least a demonstrated ability to have this technology, and the concern is the costs are going to be great.

Administrator McCarthy, has EPA ever established a new source performance standard for an emissions source on the basis of technology that has not been commercially proven by operation at commercial scale?

Ms. MCCARTHY. We have in the past, for example, our use of scrubbers was seen as an innovative but—

Mr. SHIMKUS. But it was commercially available at that time?

Ms. MCCARTHY. It was—

Mr. SHIMKUS. That is the whole difference between the clean air debate and the greenhouse gas debate is in the clean air debate

technology was available. In the greenhouse gas debate it is not available. That is really the number one concern that we have. Do you want to—

Ms. MCCARTHY. No—

Mr. SHIMKUS. I mean do you agree with that or—

Ms. MCCARTHY. Congressman, the rule has yet to be issued, but I will say that this is an issue that was heavily discussed. That is the reason why we are reproposing. We will have a full debate about this when the rule goes out, but I would indicate to you that this rule is not about existing facilities. It is about the future plants that are being constructed. And there are four plants that are planning on and designing in CCS at levels that would beat anything that we had proposed in our earlier proposal.

Mr. SHIMKUS. And I hope you are right and I hope it is successful. The point is it will be costly.

I am going to end on this, Mr. Chairman.

And I think you have litigation issues that are unknown. The State of Illinois is applying for this, as you know. Mr. Secretary, you are doing your research there. There are other issues just than being able to, you know, get this down in deep sequestration aquifers.

So thank you, Mr. Chairman. I yield back.

Mr. WHITFIELD. Ms. McCarthy, will you provide us a list of those four plants you just referred to?

Ms. MCCARTHY. Certainly.

Mr. WHITFIELD. Thank you.

At this time I recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. Thank you, Mr. Chairman. And like my colleagues, I would like to welcome Administrator McCarthy and Secretary Moniz and thank you both for appearing today and look forward to our discussion. And I have enjoyed it so far.

Administrator McCarthy, I have been concerned in the past that EPA has not taken DOE's concern about reliability seriously when developing utility rules. Can you commit to giving deference to DOE on grid reliability when drafting a rule for existing power plants? Is that part of the consideration with EPA?

Ms. MCCARTHY. We have worked hand-in-hand in developing this proposal and we certainly will on the evaluation of comments in moving any rule forward.

Mr. GREEN. OK. And I see the Secretary shaking his head, too, so I am glad you all are working together because even though we want as clean air as we can, we still want to be able to turn on the lights.

Ms. MCCARTHY. Yes, sir.

Mr. GREEN. And particularly in Texas have our air-conditioning in the summer.

I generally support the research and international efforts to address greenhouse gas emissions that the administration is undertaking. When it comes to regulating carbon from our industrial services, I do see that Congress should move past its gridlock and develop a regulatory plan instead of the EPA. I think Congress ought to do our job and particularly the Supreme Court said the EPA already has the current authority. But until Congress starts

to legislate again, we can't sit here and just complain about the EPA are doing what the Supreme Court said it has the authority. Climate change is real and it is something that Congress should act on.

Secretary Moniz, where are we with the CCS technology? I know that the plant in Mississippi may be up and running in the next year, but even that is not guaranteed. When do you reasonably expect CCS to become technologically and economically feasible?

Mr. MONIZ. Well, I think we should talk about carbon capture and sequestration. Certainly carbon capture, whether it be for combustion plants or for gasification plants, is demonstrated technology. We continue to invest in new technologies that will further reduce cost, but those are used technologies in various places, well, certainly in the petrochemical industry, in the former case, Great Plains plant in the second case.

And on sequestration side, storage side, as I said earlier, this one plant, this one field in Weyburn for enhanced oil recovery has already stored 20 million tons. And largely in Texas actually we are using 60 megatons a year for producing 300,000 barrels of oil. So this is a growing concern so the components are all there.

Mr. GREEN. Well, and I think some of our concern is that we don't want the requirements to get past what either the technology or what you can capitalize to be able to deal with. And so there needs to be coordination there if that technology is there and there are examples of it. But is the plant up in Mississippi? Do we have a timeline on when they are going to actually be up and running?

Mr. MONIZ. I believe they are operating in 2014 or 2015. It is quite close. It is a gasification plant again, and again, the CO<sub>2</sub> will go to enhanced oil recovery in local fields.

Mr. GREEN. Well, and there has been success in, you know, the Midland area, the Permian basin for, you know, enhanced oil recovery and we even have a pipeline from Mississippi to the Gulf coast to use so—

Mr. MONIZ. Yes.

Mr. GREEN [continuing]. There are examples.

Mr. MONIZ. On average in Texas it has been about a half-a-ton stored per barrel of oil produced.

Mr. GREEN. OK. I appreciate it because it is a beneficial use. We can use it for—

Mr. MONIZ. Um-hum.

Mr. GREEN [continuing]. Enhanced recovery. You testified that in developing the GHG regulations for existing power plants you engaged in the outreach to a broad group of stakeholders with expertise who can inform development of proposed standards and regulation guidelines, which you expect to issue in June of 2014. You also said that for us to be successful, the policy to be developed would have to promote economic growth. Some people say that any policy to address climate change is only going to do harm to our economy. To what degree will utilities play a role in developing these regulations? Is there a formal process already scheduled that they participate in?

Ms. MCCARTHY. EPA has already engaged in a number of utility- and energy-related forums talking about this issue and we will engage with the utilities every step of the way. It is my concerted be-

lief and I think you will see this as we talk to States that they are taking numerous actions already that are reducing greenhouse gases. There are so many States that already have renewable fuel standards, energy efficiency standards. They are working with their mayors to make their cities more efficient. There are ways in which we can recognize and understand how best we can shape these plans that States need to develop that will be beneficial to them from an economic perspective and beneficial to the U.S. and the world to reduce the threat of climate change.

Mr. GREEN. Mr. Chairman, I know I am over time, but these power companies are actually part of that process?

Ms. MCCARTHY. Very much so.

Mr. GREEN. Thank you, Mr. Chairman.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentleman from Louisiana, Mr. Scalise, for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. I appreciate you holding this hearing and, Administrator McCarthy and Secretary Moniz, I appreciate you all being here talking about climate change policies.

And of course a lot of this comes in the context of economic policy, how these policies have an impact on families, how they have an impact on the economy. We hear all the time from small businesses I meet with, I know talking to my colleagues the same thing. Some of the biggest impediments they have to creating jobs right now are policies coming out of Washington, and frankly, Administrator McCarthy, the policies coming out of EPA seem to be at the top of that list, a lot of the threats are coming out of EPA.

And I know you are new to the current job you have and that you have been at the EPA in different roles throughout the years. And I don't know if you all recognize those impacts. We have talked about them before in our committee hearings, but when you look at the climate policies that you are proposing, I want to read a comment from you recently and get your take on it. I think the administrator said this recently. "Essentially, the President said that it is time to act. He said he wasn't going to wait for Congress but that he had administrative authorities and that it was time to start utilizing those more effectively in a more concerted way."

And so, Administrator McCarthy, when you talk about the President's task to you to act regardless of what Congress does, it causes a big concern not only to Members of Congress but to people across the country who believe in a democratic process where Republicans and Democrats work together. And Congress is the body that is supposed to shape law and then the President through his Secretaries, including you, are the ones who are supposed to administer the policies that Congress passed.

And so when you are echoing the President, who says, you know what, I don't care if Congress didn't do it; it is time to act anyway, I hope you understand the chilling effect that is sent across the country. And I would like to get your interpretation of what you think the President means and what you think the authority you have to act is even if Congress chooses not to go down the path you want to.

Ms. MCCARTHY. Let me rephrase the issue in a way that hopefully is a bit more positive. I think the President—

Mr. SCALISE. Because it is not positive when I hear those comments.

Ms. MCCARTHY. I think the President has reached out and indicated that congressional action would be something that he would want to engage in and that he would welcome. I think what he has also told us to do is look at the laws that Congress has already enacted through their own public democratic process and what have they told the agencies that their responsibility is and their authority is. We are not doing anything at EPA or in the climate plan that goes outside the boundaries of what Congress has said is our mission and our authority.

Mr. SCALISE. Well, and I would hope you would keep that in mind as you develop policies because we are concerned about some of the things that you are doing in terms of them going against wishes of Congress. And the cap-and-trade bill that was defeated when there was a super majority in the Senate, so clearly Congress spoke that that is not something that we wanted. Just a few weeks ago we in the House voted. The vote was 237 to 176 to reject a carbon tax, an actual vote——

Ms. MCCARTHY. Yes.

Mr. SCALISE [continuing]. On the House Floor to reject a carbon tax and it passed overwhelmingly with Democrats voting with Republicans. And in fact Barbara Boxer was recently quoted saying, “we don’t have the votes for carbon tax or carbon fee.” I would hope you would take all of that into consideration when you are looking at climate change policies. Not only did we say we don’t want it; we voted to reject a carbon tax. And so you need to take that into consideration. That is not an authority you have, and in fact, Congress has now said that is something that you don’t have an authority. We reject that.

I want to also bring up when you look at the impacts of these kind of policies how they are working in other countries. And again it has a real impact on our economy when some of these rules are proposed, but some of these other countries across the globe have already tried to go down this road in terms of climate change policy that you are looking at. There was just a revolt in Australia in their government, a complete upheaval because of their carbon tax. In fact, there is a movement with this new government to repeal the carbon tax.

Read from the Telegraph just a few weeks ago, “Brussels fears European industrial massacre sparked by energy costs.” The Business Report, “Merkel warns E.U. against tough carbon targets.” Financial Times, “European utilities warned E.U. over energy risks.” Special Online, “Germany’s Energy Poverty: How Electricity Becomes a Luxury Good.” It goes on and on. And the U.K. Express, “3,000 pounds-a-year bills on the way as energy prices rise again.” The Telegraph, “Romanic Germany risks economic decline as green dreams spoils.”

I hope you understand that in the countries that have tried this it is failing miserably. They are having revolts in those countries. So Congress has acted. Congress has sent a message to you. I hope you would respect those messages that have been sent not just here in Congress but look at what has happened in where they have actually gone down this road in other countries and they are seeing

dramatic declines in their economy, dramatic increases in energy costs that hurt real families. These are the concerns we have. As you are looking at climate policy in your agency, recognize the will of the people here in this country.

I yield back.

Mr. WHITFIELD. The gentleman's time is expired.

This time I recognize the gentlelady from California, Mrs. Capps, for 5 minutes.

Mr. WAXMAN. Will Mrs. Capps yield to me for 30 seconds?

Mrs. CAPPS. Yes, I will.

Mr. WAXMAN. I just want to point out that there is no reason you should be mindful of proposals that even passed the House if they are not law. You have got to be mindful of what the laws are. And what you have to do is enforce the laws. So this argument you should pay attention to what Republicans were able to pass through the House is not a law.

Thank you for yielding to me.

Mrs. CAPPS. Thank you. Thank you also from me, Administrator McCarthy and Secretary Moniz, for appearing today and for your testimony.

Given the immediate and long-term threats posed by climate change, I am very encouraged that we are finally having a formal discussion on this pressing issue. With Congress's inaction, the President's Climate Action Plan is a welcome step forward and we need to debate it because we need to cut carbon pollution. We need to help prepare for the impacts of climate change.

Last February, I wrote a letter to the President signed by 40 of my colleagues urging him to create a panel to help local communities to prepare for climate change impacts. One of our key recommendations in this letter was to fully evaluate the budgetary impacts of this problem. Climate change is already costing the Federal Government tens of billions of dollars in disaster assistance, right? By investing some of this money up front in resiliency measures we could minimize these costly impacts down the road and we could create jobs doing that implementation. So I was pleased to see the President included a similar task force on preparedness in his Climate Action Plan.

Administrator McCarthy, can you discuss what the task force will be working on and to what extent it will be examining this budgetary impact? For example, will you be issuing findings comparing the long-term costs of inaction to those of building a more resilient infrastructure?

Ms. MCCARTHY. Thank you for the question. As you recognize, the President's Climate Action Plan focused just as heavily on the adaptation question as it did on the mitigation issues in the international component. I think he did that recognizing the extreme concern that communities are facing now and the public health impacts associated with not recognizing that the climate is changing and preparing for that and making our communities more resilient in a changing climate.

He established a task force to look at these issues. We are going to be working with every State and community. There is support already that has been recently issued by the Department of the Interior to look at resiliency projects, \$100 million as a result of the

Climate Action Plan moving this forward. We all have, each agency, developed Climate Action Plans. We are participating on both national forums as well as developing our own task forces to begin working with communities more effectively to integrate what we know about a changing climate into the work that we do. There is a great deal of work on going. It has been nurtured over the past few years, but it certainly has been given a boost in the action plan and will move this forward.

Mrs. CAPPS. Thank you.

Mr. MONIZ. May I just have a—

Mrs. CAPPS. Well, OK, but I have a question for you, too. Let me ask the question and then maybe you can weave that in.

DOE currently focuses heavily on more mature technologies like solar and wind. While I support these efforts of course, I want to make sure we are not neglecting some other promising renewable technologies. For example, there are several companies, including Ecomerit in my district, which are developing exciting new technologies to reliably harness energy from ocean waves, tides, and currents. In fact, Ecomerit was recently awarded a \$500,000 DOE grant to help develop its wave energy technology. This only scratches the surface, however, of public and private investments that are needed.

So, Mr. Secretary, I was going to ask you, and you can respond any way want to, what does the President's Climate Action Plan do to expand the development of marine and hydrokinetic energy technologies?

Mr. MONIZ. Thank you. If I may just add—

Mrs. CAPPS. Sure.

Mr. MONIZ [continuing]. A note to the earlier question that in addition to that task force, there has also been a specific Sandy task force led by HUD. The work that I described earlier on the micro-grid comes under that umbrella and that will be translatable to other parts of the country.

Mrs. CAPPS. Absolutely.

Mr. MONIZ. Finally, under FEMA we also have responsibilities for DOE for, you know, energy infrastructure, other agencies for other parts of our national infrastructure.

On your question to me—

Mrs. CAPPS. Yes.

Mr. MONIZ [continuing]. It is very important that we not forget what are sometimes called the forgotten renewables, and that includes—

Mrs. CAPPS. Absolutely.

Mr. MONIZ [continuing]. Hydrokinetic waves, tides, small hydro, advanced geothermal, and we are looking to increase our emphasis on those as we go forward.

Mrs. CAPPS. Thank you. If I could follow up, I would love to have a written response on some of the ways that you want to do that that I could take back to some promising industries in my local district that would love some support like the one that was given to Ecomerit in terms of clean energy technology.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time I would like to recognize the gentleman from Pennsylvania, Mr. Pitts, for 5 minutes.



Mr. PITTS. Thank you, Mr. Chairman.

Secretary Moniz, you have recently taken over leadership at DOE and you understand the role of DOE in establishing and coordinating national energy policy. Can you tell us whether DOE is going to have an active role going forward in ensuring that the climate policies pursued by other Federal agencies do not negatively affect the affordability and availability of energy?

Mr. MONIZ. Thank you for the question. The principal way in which we will be doing that over these next, say, 3 years is the so-called quadrennial review process. That will be convened out of the Executive Office of the President but the Department of Energy will be establishing the secretariat and the analytical underpinnings. And that will involve the entire administration. So that will be our principal role there. And I can also assure you, as I have in previous testimony here, that we view our job in technology development as being to innovate to keep lowering the costs of energy for our consumers and our industry.

Mr. PITTS. So you will review climate policies, regulatory initiatives of EPA that have the potential to negatively affect the affordability and reliability of energy?

Mr. MONIZ. Well, for processes—and Ms. McCarthy can answer—I mean of course we have review processes. What we will do in this context is help provide the threads, some of the analytics to bring together all the agencies to discuss energy policy broadly, environment, security, economy.

Mr. PITTS. Administrator McCarthy, I want to understand with all the climate change-related programs that your agency pursues such as research, technology development, grants, education, and outreach, does your agency determine at the outset what those programs are supposed to accomplish and then go back and evaluate whether they actually did accomplish what they set out to do?

Ms. MCCARTHY. We keep quite close track. And I would just add that many of the programs that we run are programs that Congress has specifically directed us to run and at specific funding levels.

Mr. PITTS. Now, does EPA make information about what these programs have actually achieved available to the public?

Ms. MCCARTHY. Very much so. We are quite—

Mr. PITTS. Can you identify for us what or where that information is available?

Ms. MCCARTHY. I can certainly provide that to you.

Mr. PITTS. Now, EPA has been implementing climate policies for a number of years. Have you evaluated what that work has actually accomplished in terms of meaningfully addressing climate risk and could you share that with the committee?

Ms. MCCARTHY. We certainly take a look at work that we do to understand what kind of greenhouse gas reductions might have been reduced, but as we all know, reducing climate risk is a global effort and the U.S. is participating in that effort as rigorously as we can.

Mr. PITTS. Now, Ms. McCarthy, does EPA coordinate with other agencies when it evaluates the impact of its regulatory action relating to the power sector?

Ms. MCCARTHY. Very much so. In every regulatory process all agencies participate in the interagency review. Part of that is to look at the cost-and-benefit analysis that EPA produces and to comment on both of those. Those are——

Mr. PITTS. For example, have you consulted with the Department of Health and Human Services about the impact of energy poverty or higher energy prices on health or the ability to respond to extreme weather events?

Ms. MCCARTHY. Well, what we have done is to ensure that we do a complete analysis to the extent that it is available to us and appropriate on what the economic consequences are of our rule-making, and we take great pains to make sure that we do not threaten reliability, nor do we put out rules that will significantly increase cost to consumers.

Mr. PITTS. One other question, Administrator McCarthy. The President's Climate Action Plan says on page 10 that "curbing emissions of methane is critical to our overall effort to address climate change." And it refers to an Interagency Methane Strategy Group——

Ms. MCCARTHY. Yes.

Mr. PITTS [continuing]. That is identifying technologies and best practices for reducing methane emissions. I should also note that EPA's Web site indicates that we can cut methane significantly by reducing reliance on landfilling and increasing use of modern waste-to-energy facilities like the one in my district, the Lancaster County Solid Waste Management Authorities facility. Will you recommend to the Interagency Methane Strategy Group or may I request that you recommend the importance of focusing on ways to increase the United States' use of waste energy for managing non-recyclable waste?

Ms. MCCARTHY. We will raise that issue but I think if you see the tone and tenor of the President's remarks in the Climate Action Plan, it is an effort to understand where methane is being generated, how effectively to work with the industry on strategies that will reduce that methane and recapture it because it becomes a significant financial opportunity. Those are the kinds of things we certainly want to capitalize on.

Mr. PITTS. Thank you.

Mr. MONIZ. If I may add, the \$1 billion loan guarantee program that we will be issuing would include MSW technologies as a possibility.

Mr. PITTS. Thank you, Mr. Chairman. My time is expired.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentleman from Pennsylvania, Mr. Doyle, for 5 minutes.

Mr. DOYLE. Thank you, Mr. Chairman.

Administrator McCarthy, it is a pleasure to have you here today.

Secretary Moniz, I just want to say your recent visit to Pittsburgh was appreciated and well-received by all of us in attendance and we hope to have you back there soon.

Well, your visit is very timely today because many of us are eagerly awaiting the first rule regulating carbon pollution from power plants, the single-biggest emitter of carbon in the United States. And though I think the legislation to address climate change

through a cap-and-trade system would have been an easier, more direct approach to limiting our Nation's global warming impact, we tried that here in this committee, and unfortunately, we were unable to get it passed.

But having said that, I want to point out that where I live in southwestern Pennsylvania we are witnessing coal plant retirements nearly every month, which is impacting the economy and many of our constituents and potentially the reliability of the electric grid. Now, whether that is because of low natural gas prices, environmental regulations, or old age, the fact is we are taking a lot of old power plants off-line and making it very difficult to build new ones.

So the central tenet of the President's Climate Change Plan is of course the new source performance standards for power plants. And it has been widely reported that the standard for new coal-fired power plants would require some type of CCS technology to comply. Now, I am aware of and have supported the creation of several demonstration projects for CCS across the country, but I am not aware that there is anyone that would be considered BSER, you know, the best system of emission reductions, as defined by the Clean Air Act. Can you tell me how CCS is going to achieve that requirement that BSER be adequately demonstrated considering cost, energy requirements, and environmental impacts?

Ms. MCCARTHY. Congressman, first of all, it is good to be here. Thank you for the welcome.

The first thing I would say is that relative to the retirements that you were discussing, we have been very strongly engaged with our energy colleagues to ensure that as retirements are happening that we work with our energy office and our agency and others to make sure that those issues are managed effectively, and we do not see that there is any gap in our communication system in ensuring that we can achieve those regulatory standards effectively without threatening reliability.

In terms of the rule that is coming out, I do not want to speak exactly to what the rule is going to say. It would be inappropriate for me to do that. But I will say that on the basis of information that we see out in the market today and what is being constructed and what is being contemplated that CCS technology is feasible and it is available today.

Now, that is not to give a signal about what is going on in the rule. That needs to be put in a broader as well as a more specific context and we will meet our regulatory obligation to look at what is possible and what we should be doing for new future power plants. Frankly, the challenge is that we need to provide certainty for how you construct a coal facility in the future that will allow investment in that technology and allow the technologies that you are investing in to grow and become more and more competitive and lower those costs.

Mr. DOYLE. Let me ask you a little follow-up to that because I am aware of the Kemper plant in Mississippi that has been cited. Now, that plant is utilizing an innovative technique that pipes the carbon dioxide emissions to depleted oil fields and uses the CO<sub>2</sub> to force oil to the surface. In Pennsylvania, that is a little less real-

istic for us unless we want to build a pipeline to Texas for our CO<sub>2</sub>, which I don't think is quite practical.

I am just curious. How is EPA taking into account the regional differences that there are from, you know, different places in our country as we look at these technologies? You know, this seems to be working but it is not something that could work in my neck of the woods. And are you going to, you know, create guidelines that recognize the diverse fuel mix of the country and specifically those regions like southwestern Pennsylvania that are still heavily dependent on fossil fuels?

Ms. McCARTHY. Well, I think we all recognize that the use of CO<sub>2</sub> that is captured in enhanced oil recovery becomes very cost-beneficial in the use of CCS. There is no question about that. And we also see part of that being as a result there are significant pipelines that are being constructed to take advantage of those cost considerations.

Now, there is also an opportunity to sequester, which is, I think, demonstration projects and investments that the Secretary can speak to, but there are also products that are being produced at the end of these design systems that actually can be sold. So there is a variety of things that we see developing that make it very promising for coal to have a certain future as the President intends in an all-of-the-above strategy.

Mr. DOYLE. Thank you very much. Mr. Chairman, I see my time has expired.

Mr. WHITFIELD. Mr. Doyle, I may mention to you that this rule is expected out on Friday, I believe, by the 20th, and we will be having a hearing on the proposed rule.

Mr. DOYLE. Thank you.

Mr. WHITFIELD. On Saturday afternoon. Will everybody be here on Saturday?

At this time I recognize the gentleman from Nebraska, Mr. Terry, for 5 minutes.

Mr. TERRY. What an unexpected surprise to go this early. I appreciate that.

So I am going to start off by asking unanimous consent to put the letter of our Attorney General from Nebraska, his letter to Gina McCarthy and a white paper that was done with other AGs into the record.

Mr. WHITFIELD. Without objection.

[The information follows:]



STATE OF NEBRASKA  
**Office of the Attorney General**

2115 STATE CAPITOL BUILDING  
LINCOLN, NE 68509-8920  
(402) 471-2682  
TDD (402) 471-2682  
FAX (402) 471-3297 or (402) 471-4725

**JON BRUNING**  
ATTORNEY GENERAL

September 11, 2013

The Honorable Gina McCarthy  
Administrator  
U.S. Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N. W.  
Mail Code: 1101A  
Washington, DC 20460

Re: EPA Performance Standards for Greenhouse Gas Emissions for Existing Electric  
Generating Units

Dear Administrator McCarthy:

The Attorneys General of seventeen states and the senior environmental regulator of an eighteenth have followed with interest EPA's statements regarding its intention to promulgate guidelines for performance standards for greenhouse gas (GHG) emissions from existing electric generating units (EGUs).

We recognize EPA's obligation to promulgate these guidelines through an open and transparent process, which would include input from all stakeholders. As the statutory responsibility and authority under Section 111(d) for developing and implementing performance standards is vested at the state level, we intend to participate fully in this process as representatives for our States.

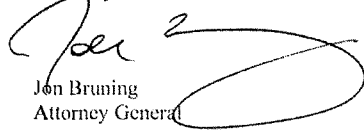
Enclosed with this letter is a white paper setting forth our position on both EPA and the states' authority under Section 111(d). The white paper responds to EPA's aggressive proposal for GHG performance standards for new EGUs and indications of a similarly aggressive stance on existing EGUs. Our concerns are justified given EPA's unwillingness to appropriately defer to State authority under the Clean Air Act in recent years.

Ms. McCarthy  
Page Two  
September 11, 2013

As the white paper describes, Section 111(d) is unambiguous in granting to states the sole authority to determine actual substantive standards as applied to individual sources. EPA's role is limited to establishing procedures whereby states develop and implement performance standards for existing EGUs. We trust EPA will to adhere to the limitations of its authority under the Clean Air Act when adopting guidelines for the states' development of plans for GHG performance standards for existing EGUs.

We appreciate your consideration of our position and restate our commitment to cooperative federalism as required under the CAA.

Sincerely,



Jon Bruning  
Attorney General

**Perspective of 18 States on Greenhouse Gas Emission Performance Standards  
for Existing Sources under § 111(d) of the Clean Air Act.**

**Introduction**

As State Attorneys General, we believe it is critical to bring public awareness to another example of what has unfortunately become routine: the United States Environmental Protection Agency (“EPA” or “Agency”) is poised to yet again propose new regulations that venture well beyond the limits of the agency’s authority. The President has called upon EPA to propose greenhouse gas (GHG) emission standards, regulations, or guidelines for *existing* power plants by June 1, 2014, and to finalize those rules by June 1, 2015. As this paper will show, EPA’s authority under the Clean Air Act is limited to developing a procedure for *states* to establish emissions standards for existing sources. EPA, if unchecked, will continue to implement regulations which far exceed its statutory authority to the detriment of the States, in whom Congress has vested authority under the Clean Air Act, and whose citizenry and industries will ultimately pay the price of these costly and ineffective regulations.

Last year, EPA published a proposed rule regulating carbon dioxide (“CO<sub>2</sub>”) emissions from new electric utility generating units (“EGUs”). 77 Fed. Reg. 22,392 (April 13, 2012) (“EGU NSPS”). In light of recent comments from industry, EPA is considering the need to re-propose this standard due to its failure to finalize the action within the CAA’s 1-year timeframe. In addition, on April 15 and 17, 2013, some states and environmental groups filed 60- and 180-day Notices of Intent to sue EPA under section 304(a) of the Clean Air Act (“CAA”) for failure to perform the allegedly non-discretionary duty of and/or unreasonably delaying finalizing the

EGU NSPS and proposing standards for existing EGUs.<sup>1</sup> In response to these Notices, a coalition of Attorneys General has requested to be involved in any settlement discussions with advocates of broad federal GHG regulations.

EPA states that once it has issued regulations for an air pollutant from *new* sources in a particular source category under the CAA § 111(b), it has legal authority to regulate emissions from *existing* sources of that air pollutant within the same source category.<sup>2</sup> The final version of the new source performance standards for new EGUs will likely face legal challenge. However, the following analysis assumes the final EGU NSPS for GHG emissions is upheld and EPA moves forward with rulemaking for existing sources.

The purpose of this paper is to identify a timely example of a serious, ongoing problem in environmental regulation: the tendency of EPA to seek to expand the scope of its jurisdiction at the cost of relegating the role of the States to merely implementing whatever Washington prescribes, regardless of its wisdom, cost, or efficiency in light of local circumstances. The issue is not new. The States and EPA have been at odds over the scope of their respective responsibilities under the federal environmental statutes since the statutes' inception. The recent increase in the level of federal regulatory activity under the Clean Air Act has generated a

---

<sup>1</sup> A settlement agreement entered into by a number of states and environmental groups in December 2010 set forth deadlines for EPA to issue regulations with respect to GHG emissions from existing EGUs. See, 75 Fed. Reg. 82,392 (Dec. 20, 2010). The deadlines have passed.

<sup>2</sup> The authority of EPA to promulgate GHG NSPS for existing EGUs, even if it finalizes its proposed GHG NSPS rule for new EGUs, has been questioned. See William J. Hann, *The Clean Air Act as an Obstacle to the Environmental Protection Agency's Anticipated Attempt to Regulate Greenhouse Gas Emissions from Existing Power Plants*, THE FEDERALIST SOCIETY (Mar. 2013), available at <http://www.fed-soc.org/publications/detail/the-clean-air-act-as-an-obstacle-to-the-environmental-protection-agencys-anticipated-attempt-to-regulate-greenhouse-gas-emissions-from-existing-power-plants>. Without conceding that EPA does have authority to promulgate a GHG NSPS for existing EGUs, we assume for purposes of discussion here that EPA does have that authority and will exercise it.



corresponding increase in concerns among the States regarding the preservation of their role in environmental protection.

The way in which EPA has “pushed the envelope” in interpreting its legal authority under the CAA to promulgate a New Source Performance Standard for new EGUs portends a similarly aggressive and unlawful approach to the regulation of existing EGUs. EPA’s clear policy goal in establishing its new source standards is to prevent the construction of new coal plants. EPA’s proposed EGU NSPS would foreclose the construction of new coal-based electric generation absent carbon capture and storage (“CCS”), yet CCS is likely to remain commercially infeasible for a decade or more. The elimination of coal as a fuel for new electric generation would have highly concerning implications for electricity prices and for the economy and job-creation in general, as well as the competitiveness of American manufacturing.

In order to justify its proposed standard that would not allow new coal-based EGUs absent CCS, EPA has taken unprecedented steps. The Agency proposed to combine coal and combined-cycle natural-gas units into a single regulatory category, something it has never done before for coal and gas EGUs. Indeed, it did not even go so far as recently as last year when it proposed NSPS for traditional pollutants emitted by EGUs. EPA’s aggressive posture in its proposed new-source NSPS, both as to foreclosing new coal plants and in pushing the scope of its claimed legal authority, raises serious questions as to the approach EPA will eventually take when it promulgates existing-source NSPS.

If EPA proceeds against existing coal plants with the same hostility, it is likely to be reversed in court. As this paper shows, EPA does not have authority to promulgate prescriptive limitations for existing coal-fueled EGUs. Under section 111(d) of the CAA, EPA must recognize that States have broad discretion to determine the nature of NSPS requirements for

existing EGUs. EPA may require States to adopt standards, and EPA may guide how States do so procedurally, but the States are vested with the legal authority to decide the ultimate standards.

### **The Statutory and Regulatory Framework For Developing Performance Standards For Existing Sources**

The focus of the following analysis is the limitations Congress placed on EPA's authority under Section 111(d) of the CAA. Section 111(d) provides EPA with the authority to develop standards of performance for existing sources and directs the Agency to:

prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which establishes standards of performance for any existing source for any air pollutant...to which a standard of performance under this section would apply if such existing source were a new source.

Section 111(d) requires the existence of a performance standard for new sources as a condition precedent to the development of such standards for existing sources. Thus, the legality of the final version of EPA's EGU NSPS rule has significant implications for EPA's ability to require regulation of existing EGUs.

Most importantly, section 111(d) invokes the principle of cooperative federalism – with roles clearly delineated for both EPA and the States. The reference to § 110 refers to the general process by which States submit their State Implementation Plans (“SIPs”) for EPA review. Accordingly, EPA's authority under § 111(d) is limited to establishing, in the statute's term, a “*procedure*” by which the States submit plans for regulating existing sources. EPA cannot promulgate rules establishing the substantive standards to be imposed on existing sources.

The cooperative federalism is illustrated by EPA's general procedural regulations relating to the States' adoption and submittal of plans establishing standards of performance for existing

sources. Those regulations require EPA to issue a “guideline document” concurrently with, or after, the “proposal of standards of performance for the control of a designated pollutant from affected facilities.” 40 C.F.R. § 60.22(a). The content of the guideline document is of great importance to the preservation of the States’ role in the development of performance standards for existing sources.

Under EPA’s regulations, the guideline document is to “provide information for the development of State plans” including a “description of systems of emissions reduction which, in the judgment of the Administrator, have been adequately demonstrated.” *Id.* at (b)(2). The guideline document also shall contain an “emission guideline” providing “criteria for judging the adequacy” of § 111(d) plans. 40 C.F.R. § 60.22(b)(5); *see*, 40 Fed. Reg. 53,341 (Nov. 17, 1975). The emission guideline “reflects the application of the best system of emission reduction (considering the cost of such reduction) that has been adequately demonstrated.” 40 C.F.R. § 60.22(b)(5). The emission guideline must also allow sub-categorization “when costs of control, physical limitations, geographical location, or similar factors make [it] appropriate.” *Id.*

Also under EPA’s regulations, the States have nine months to submit a “plan for the control of the designated pollutant to which the guideline document applies.” 40 C.F.R. § 60.23(a)(1). The plan “shall include emission standards” that “shall prescribe allowable rates of emissions except when it is clearly impracticable.” 40 C.F.R. § 60.24(a), (b)(1). The States have significant discretion in formulating these plans. Although the “emission standards” are to be “no less stringent than the corresponding emission guideline(s), the States may make a case-by-case determination that a specific facility or class of facilities should be subject to a less-stringent standard or longer compliance schedule due to 1) cost of control; 2) physical limitation of installing necessary control equipment; and 3) other factors making the less-stringent standard

more reasonable. *See*, 40 C.F.R. § 60.24(c), (f). EPA then has four months to determine whether the plan meets the requirements discussed above. If EPA disapproves the plan, the State may correct the deficiencies or, under EPA's construction, the Agency may issue its own plan within 6 months of the original submission deadline. *See*, 40 C.F.R. § 60.27(c), (d).

Although these regulations have never been tested in court, EPA undoubtedly has power to adopt procedural regulations governing State adoption of plans setting forth performance standards. But, importantly, and consistent with the statute, the determination of the actual substantive standards is left to the states.

#### **Existing Source Performance Standards for CO<sub>2</sub> Emissions from EGUs**

In contemplating regulation of existing EGUs, however, EPA appears poised to go beyond the establishment of procedures and usurp the states' authority by setting minimum *substantive* requirements for state performance standards. Having reviewed the statutory and regulatory requirements for developing standards of performance for existing sources in a general sense, we now apply that legal framework to CO<sub>2</sub> emissions from EGUs. Although EPA has not yet issued a proposed guideline document for CO<sub>2</sub> emissions from existing EGUs, we offer general observations about potential issues that have already presented themselves.

Fundamentally, § 111(d), as well as EPA's own regulations, require that emission reductions be made through adequately demonstrated systems of emission reduction technology. Under § 111(d), EPA establishes procedures for States to submit plans containing "performance standards." "Performance standards" is defined in § 111(a): "The term 'standard of performance' means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and

environmental impact and energy requirements) the Administrator determines *has been adequately demonstrated.*” (Emphasis supplied). And EPA’s guideline document and the emission guideline contained therein are to “reflect[] the application of the best system of emission reduction (considering the cost of such reduction) that has been adequately demonstrated.” 40 C.F.R. § 60.22(b)(5); *see also*, 42 U.S.C. § 7411(1) (definition of “standard of performance”). The crux of this requirement thus is that the system be, in fact, adequately demonstrated.

It seems incontrovertible that no post-combustion reduction system has been “adequately demonstrated” for CO<sub>2</sub> emissions from EGUs on a broad, commercial scale. A system of carbon capture and storage is perhaps a decade away from being technologically and economically feasible. A permitting system for storing CO<sub>2</sub> emissions underground and a set of legal rules governing liability for CO<sub>2</sub> storage has not been put in place in most states. Without an adequately demonstrated post-combustion control technology, EPA must look to standards based on cost-effective efficiency improvements at electric generating units, because more efficient units will produce lower CO<sub>2</sub> emissions per unit of heat input or electricity output.

EPA and others may believe that efficiency measures will not ensure the amount of CO<sub>2</sub> emission reductions they desire. As a result, some groups have proposed EPA be given flexibility to develop emission guidelines based on trading programs with statewide emissions caps, increased reliance on lower CO<sub>2</sub> emitting facilities, or demand-side and non-regulated source reductions. In short, EPA may attempt to force coal-fueled EGUs to decrease operation time or retire early, or force utilities to rely more heavily on natural gas and other resources in an effort to ensure greater CO<sub>2</sub> emission reductions. Such proposals, often offered as ways of providing “flexibility,” do not conform to the limitations Congress has placed on EPA in the

Clean Air Act, nor do they properly preserve the primary role of States in the development of standards of performance for existing sources. Under § 111(d), it is the States, not EPA, that are authorized to adopt performance standards; therefore it is the States, not EPA, that weigh the § 111(a)(1) factors to determine what technology is adequately demonstrated. Simply put, EPA lacks statutory authority (and is limited by its own regulations) to issue emission guidelines seeking reductions of CO<sub>2</sub> emissions from coal-based EGUs in a manner based on something other than an adequately demonstrated reduction system for such EGUs.

To the extent § 111(d) provides authority for flexible approaches to establishing performance standards to seek reductions in CO<sub>2</sub> emissions, that authority is vested in States, not EPA. And of course, under § 116, States retain authority to adopt more stringent CO<sub>2</sub> controls than EPA has the authority to mandate.

As noted, § 111(d) specifies that EPA's regulatory authority is limited to developing a *procedure* for the submission of state plans. EPA's general regulations authorizing the issuance of emission guidelines that establish minimum requirements, depending on how EPA implements this guideline authority in a particular case, bear on substantive standard-setting. But EPA does not have the authority to establish minimum substantive requirements.

EPA cannot dictate substantive outcomes. The agency can require that States actually adopt performance standards based on application of the § 111(a)(1) factors.

States are additionally afforded the discretion to consider "among other factors, the remaining useful life of the existing source to which such standard applies" when developing performance standards for existing units. Beyond this, § 111(d) does not provide authority for EPA to reject a State plan if it does not contain a standard of performance as that term is defined, and based on the factors set forth, in § 111(a)(1).

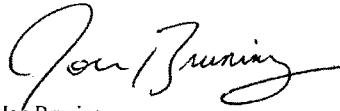
In sum, the CAA imposes responsibility for air pollution control at the State and local levels because of the proximity to existing sources and familiarity with local operating conditions. State implementation plans are thus the primary architecture of emission controls. See §§ 107(a); 110(a); 111(d). The “structure of the CAA militates against reading an extra-statutory requirement into the Act’s limitations on state discretion. Because the states enjoy ‘wide discretion’ in implementing the Act, the imposition of newfound restrictions upsets the Act’s careful balance between state and federal authority. *Union Elec. Co.*, 427 U.S. at 250; see also *Fla. Power & Light Co.*, 650 F.2d at 587 (‘The great flexibility accorded the states under the Clean Air Act is . . . illustrated by the sharply contrasting, narrow role to be played by EPA.’).” *Luminant Generation Co. v. EPA*, 675 F.3d 917, 929 (5th Cir. 2012). EPA’s role for existing sources is therefore “confine[d]...to the ministerial function of reviewing SIPs for consistency with the Act’s requirements.” *Luminant Generation Co. v. EPA*, 675 F.3d 917, 921 (5th Cir. 2012).

### **Conclusion**

The prospect for EPA adoption of GHG performance standards for new or existing coal-based EGUs raises serious concerns. EPA’s aggressive standards for new coal-based EGUs indicate a similarly aggressive approach to existing coal-based EGUs. While EPA is authorized to require States to submit plans containing performance standards, EPA may not dictate what those performance standards shall be. Nor may EPA require States to adopt GHG performance standards that are not based on adequately demonstrated technology or that mandate, in the guise of “flexible approaches,” the retirement or reduced operation of still-viable coal-based EGUs.

These concerns are serious. EPA regulations may harm the nascent economic recovery. Moreover, our federalist system of government, as implicated in the CAA, requires that EPA

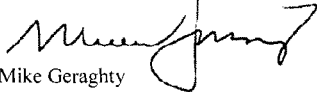
recognize the rights and prerogatives of States. The extent and form of greenhouse gas regulation is important to the States; it is critical that States be allowed to play their proper roles in making the significant policy judgments that are required in adopting any such regulation.



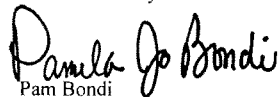
Jon Bruning  
Nebraska Attorney General



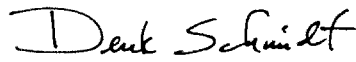
Scott Pruitt  
Oklahoma Attorney General



Mike Geraghty  
Alaska Attorney General



Pam Bondi  
Florida Attorney General



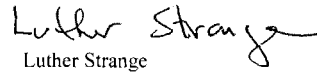
Derek Schmidt  
Kansas Attorney General



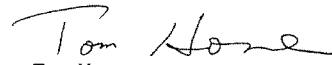
Tim Fox  
Montana Attorney General



Bill Schuette  
Michigan Attorney General



Luther Strange  
Alabama Attorney General



Tom Horne  
Arizona Attorney General



Sam Olens  
Georgia Attorney General



Jack Conway  
Kentucky Attorney General



Wayne Stenehjem  
North Dakota Attorney General





Mike DeWine  
Ohio Attorney General



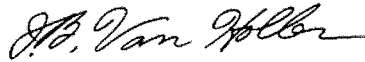
Alan Wilson  
South Carolina Attorney General



Marty Jackley  
South Dakota Attorney General



Patrick Morrissey  
West Virginia Attorney General



J.B. Van Hollen  
Wisconsin Attorney General  
of Environmental Management



Tom Easterly  
Commissioner, Indiana Department  
of Environmental Management

Mr. TERRY. And the date of the letter is September 11, 2013.

It is particularly, Ms. McCarthy, important to note that our Attorney General is involved in this because, A) it is an impact to our State, but B) we are a public power State so he is a lawyer, in essence, for our public power generators. And they have a concern on the rules that are being promulgated. I know they aren't finalized yet but, nonetheless, in regard to coal as a new fuel, we have old coal-fired plants that probably aren't going to make it. They aren't going to be able to adhere to the new rules, so the issue is can we build new plants with coal since we are only a couple hundred miles from the Powder River basin, and this is by far the prominent feedstock for our generators?

So he has a question and I have the same question and that is that does the EPA believe that it has the legal authority to eliminate coal as a fuel for nuclear electrical generation?

Ms. MCCARTHY. We have the authority and responsibility to establish standards in the case of new facilities and guidelines where the individual States look at their own energy mix and come back to EPA with plans on how to comply. So I do think we believe that we are moving in a legally sound direction, but I would also caution you that one of the reasons we are re-proposing, Congressman, is because there were a lot of comments on our original proposal. There were comments on the technology, there were legal concerns, so I would ask that we have this conversation in a more concrete way when the new source rule comes out and to not also project what we are doing in the new source as being either appropriate or legally correct for existing facilities because neither is the case.

Mr. TERRY. All right. And I appreciate that answer and it would be easier if we had the final rule.

Ms. MCCARTHY. Well, we haven't even proposed one yet, sir. We are planning to re-propose a rule.

Mr. TERRY. OK.

Ms. MCCARTHY. So we will have certainly plenty of time——

Mr. TERRY. Well, we certainly have concerns regarding our ability to use the cheapest and most readily available feed source for electrical generation——

Mr. WHITFIELD. Mr. Terry, I may just interject one moment. We were truthfully so shocked by the original rule that——

Mr. TERRY. Yes.

Mr. WHITFIELD [continuing]. We are anticipating what the new rule is, so, sorry.

Mr. TERRY. Well, and to follow up on that though is with the newly to-be-proposed rule after the comments, is there still room for new coal electrical generation?

Ms. MCCARTHY. I think that the rule will provide certainty for the future of new coal moving forward, and I think in terms of existing facilities, we believe that coal represents now and will continue to represent a significant portion of the energy supply moving forward for decades to come.

Mr. TERRY. All right. How about there has been several questions regarding nuclear power as well, and can we even meet what the new greenhouse gas standards will be without nuclear power as part of the portfolio?

Ms. MCCARTHY. The new source standard isn't designed to influence the existing portfolio. It is designed to ensure that future power plants that are being constructed to take advantage of technologies that will ensure that they are as clean as they can be and have a past certain and a future that will be carbon-constrained.

Mr. TERRY. Well, it is important, I think, to have nuclear power which has basically zero greenhouse gas emissions——

Ms. MCCARTHY. I think the President——

Mr. TERRY [continuing]. To be part of our portfolio and——

Ms. MCCARTHY. The President certainly shares your concern that we make room for all fuels and all power generation types.

Mr. TERRY. Yes, we are going to grade on actions, not words. So I appreciate that.

Mr. MONIZ. And if I may add on that, sir, I would note that we went through, in my view, a lot of years with words and not actions and we are now seeing actions and not words, \$8 billion loan guarantees for nuclear new programs on small modular reactors. So I would say that we are walking the talk.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentlelady from California, Ms. Matsui, for 5 minutes.

Ms. MATSUI. Thank you, Mr. Chairman.

And I thank our distinguished witnesses for joining us today.

I applaud the administration for taking on climate change, and I strongly support the goals of the President's Climate Action Plan to cut carbon pollution and better prepare our country for the impacts of climate change. Human-caused climate change is real, it is happening now, and it will continue to produce devastating effects unless we take immediate action. Failure to act in an urgent manner is shortsighted and detrimental to our environmental and economic interests.

Some say that addressing climate change will cost too much money but they neglect to consider the cost of inaction, as well as the tremendous economic benefits of positioning our country as a global leader in clean energy. Clean energy industries currently employ hundreds of thousands of Americans and the potential growth in this sector is enormous. My home district of Sacramento boasts 14,000 clean energy jobs. Throughout the United States, there are already 119,000 solar jobs and 80,000 wind jobs. Thousands more are employed in energy efficiency and other areas. This is a sector that could create millions of jobs and lead to faster economic growth.

But we do have competition. According to the Pew Charitable Trust, last year, China invested \$65 billion in clean energy compared to only \$36 billion in the United States. The U.S. ranked 10th in clean energy investments per dollar of GDP behind China, all of Europe, Canada, Australia, South Africa, and Japan.

Secretary Moniz, these other countries recognize the economic potential of clean energy. What are they doing to capitalize on it?

Mr. MONIZ. They meaning other countries?

Ms. MATSUI. Yes.

Mr. MONIZ. Clearly, I think people are seeing frankly, you know, trillion-dollar markets developing. They are developing now for clean energy to address climate, to address air pollution, just to ad-

vance technology. And certainly a country like China, as you know, is providing significant incentives for domestic manufacturing capacity.

Ms. MATSUI. Well, you know, the United States has always been a leader in clean energy technologies but clearly we are really facing these competitive challenges from abroad. The President's Climate Action Plan is a critical step to ensure not just that we address the dangers of climate change but also that the United States can compete and lead in the clean energy economy of the future. Secretary Moniz, how will the President's Climate Action Plan spur clean energy innovation in the United States and create new clean energy jobs here at home? Do you believe that the United States can once again lead the clean energy revolution?

Mr. MONIZ. I certainly think we can and we must lead that revolution. And I will mention two ways in which we are moving forward. And the one is, for example, through our continuing loan program to bring, as I said earlier, many, many technologies to the fore. I mentioned utility-scale solar has been a huge success and California has been a big part of that but also the loan program for advanced fossil and for nuclear. It is across the board for these technologies.

Another different kind of initiative I alluded to earlier are things like the Advanced Manufacturing Initiative where we want to capture things like 3-D printing, which can apply to new energy technologies, as well as a host of other technologies. So those are some of the things that we are moving forward.

Ms. MATSUI. Um-hum. Well, thank you. Now, my Republican colleagues are quick to argue that tackling climate change will hurt the economy, but in reality, climate change itself poses an enormous economic risk, and failure to address it could be disaster for the global economy.

In May CBO released a report concluding that delaying action to reduce carbon pollution would increase the expected damage from climate change by increasing the risk of very costly, potentially even catastrophic outcomes. The Clean Air Act provides a very good example of how we can make steady progress in cleaning up the air while growing the economy. Since its enactment in 1970, the Clean Air Act has reduced key air pollutants in the United States by 2/3 while the economy has tripled in size. Administrator McCarthy, what does the history of the Clean Air Act tell us about our ability to cut pollution while building the economy?

Ms. MCCARTHY. Thank you for asking the question.

We know that in our experience under the Clean Air Act we have been able to significantly lower pollution while at the same time GDP has risen and the economy has grown. We know that the economic goals do not have to conflict with our environmental standards, and we also know, in fact, that this country is where it is because we have both cleaned our environment, kept it safe and healthy for our families, recognized the public health value and environmental value that represents, while we develop an economy that respects those needs as well. We are asking for that same strategy to be employed as we tackle what I believe to be the most significant public health challenge of our time, which is climate change.

Ms. MATSUI. I thank you very much and I ran out of time.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time I recognize the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

I think we can agree that the CO<sub>2</sub> levels are undeniably increasing and some scientists and climatologists have concluded that their energy models reflect that CO<sub>2</sub> levels coincide with temperature increases. Now, we were supposed to have some charts up here. These are the models that have been suggested by many of the scientists and climatologists, but however, as you well know, these models are key components of developing climate change policy, but unfortunately, as we are finding out, this is the projection but here is the reality of temperature changes over the last 40 years. Actually, we can say over 40 years there has been almost no increase in temperature, very slight. In fact, the CO<sub>2</sub> levels even with the increased greenhouse CO<sub>2</sub> level emissions, the Arctic ice has actually increased by 60 percent as shown by the aerial view. Also that Antarctica is expanding. But more importantly, this report coming out of the United Nations, the IPCC report coming up is saying that most experts, most experts believe by 2083, and 70 years, the benefits of climate change will still outweigh the harm.

That leads to the question today. What should be done about it? We hear the testimony from the Administration that all climate change is manmade and America needs to reduce its CO<sub>2</sub> emissions. Let's put this in perspective. Hypothetically, let's assume that all coal-fired generation in America were curtailed, all coal-fired generation were curtailed. According to the United Nations and the IPCC, this would reduce the CO<sub>2</sub> levels of the globe by merely  $\frac{2}{10}$  of 1 percent by ridding all coal-fired power in the United States.

The Administration also needs to remind people, as you heard from the chairman in his opening remarks, that manmade problems, if we could, only represent 4 percent of all the emissions of the globe. Natural emissions represent 96 percent. So as a result, this Administration is, by virtue of this stream of job-killing regulations, is putting our Nation at risk all in the idea of clinging to the notion that cutting  $\frac{2}{10}$  of 1 percent is going to save the world environment.

Let me remind, the rest of the world is not listening. The President's energy policy is not being followed. China, India, Russia, and Europe are all expanding their use of coal. The Administration is working now on a new global initiative, exporting uncertainty. According to the President, he is not going to allow low-interest loans to be made to developing nations around the world. Struggling nations to come out of poverty will continue to suffer. Lives will be lost. Children will be sick and perish as a result of this President's support of this policy.

One of the biggest moral responsibilities of the United States should be to help emerging nations come out of poverty. The most abundant and resourceful source of power is coal. For a nation to emerge from poverty, it must have access to energy, energy for refrigeration, for cooking, and commerce.

Just to give you an example, in the sub-Saharan of Africa, the total amount of power that they can generate in Africa is a 60 watt light bulb per person, a 60 watt light bulb for 3 hours a day, 60 watt light bulb for 3 hours a day. Why should they be denied access to affordable energy so they can come out of poverty? Please take this message back to the President.

This President must not prevent people around the globe from obtaining affordable, dependable energy. And threatening American jobs over  $\frac{2}{10}$  of 1 percent of the CO<sub>2</sub> emissions is not an acceptable energy policy. Crushing America's economy to reduce the CO<sub>2</sub> levels by  $\frac{2}{10}$  of 1 percent is an abuse of his presidential authority.

Now, if I could in just the time, I am just curious from both of you the issue now is we are 400 parts per million. Can you tell me what level do you want it to be? Is it what many people are promoting, 300 parts per million?

Mr. WHITFIELD. You all can respond but his time is expired.

Mr. MONIZ. OK. I would like to respond, Mr. McKinley. There were a lot of issues you raised there. If I may focus down for the sake of response, first of all, as I have said before in this committee, the issues in terms of the risks of climate change are not based just upon models, as I said. It is some pretty simple arithmetic. Number two, I don't believe anyone has ever said that quotes "all climate change is manmade." The statement is that the anthropogenic forcings from CO<sub>2</sub> are clearly of the scale that have long been expected to produce the kinds of change that we are seeing and will see.

Third, I think we should address—there are many things but let me focus on the hiatus, so-called, in the increase of warming temperatures. First of all, let's not forget this decade is the warmest decade in recorded history. So it is not exactly like it has been cooling off.

But secondly, the issues of decadal scale changes in the rate of increase are fully expected. El Niño, La Niña, for example, are part of this. Those models at that time did not include other issues such as deep water warming, et cetera.

I will give you an example. There is an article right now in Nature whereby looking at the observed surface water temperatures in the Pacific, putting them in in the East Central Pacific, putting them in, it comes completely with this hiatus and it is only a hiatus in the constant global warming. So I believe we have to say this is a misreading of the record.

The statement stands that anthropogenic CO<sub>2</sub> emissions and other greenhouse gas emissions are a driver at the level of multiple degrees centigrade in this century. We are up .9 so far. And that is very consequential. In fact, I remind you that we wouldn't be here if it weren't for the greenhouse effect of water vapor, which has provided 60 degrees Fahrenheit of surface warming. We are just tuning that by a few degrees centigrade at great peril.

Mr. WHITFIELD. We are going 2 minutes and 35 seconds over so—

Mr. WAXMAN. Mr. Chairman, I would like to ask unanimous consent that we put in the record a study by Dr. Benjamin Santer, atmospheric scientist at Lawrence Livermore National Laboratory,

where he says neither volcanoes nor the sun nor internal variability nor any combination of those natural factors can plausibly explain the atmospheric temperature changes we have actually observed from space since 1979.

Mr. WHITFIELD. Without objection.  
[The information follows:]

# Human and natural influences on the changing thermal structure of the atmosphere

Benjamin D. Santer<sup>a,1</sup>, Jeffrey F. Painter<sup>a</sup>, Céline Bonfils<sup>b</sup>, Carl A. Mears<sup>b</sup>, Susan Solomon<sup>c</sup>, Tom M. L. Wigley<sup>d,e</sup>, Peter J. Gleckler<sup>a</sup>, Gavin A. Schmidt<sup>f</sup>, Charles Doutriaux<sup>g</sup>, Nathan P. Gillett<sup>g</sup>, Karl E. Taylor<sup>a</sup>, Peter W. Thorne<sup>h</sup>, and Frank J. Wentz<sup>b</sup>

<sup>a</sup>Program for Climate Model Diagnosis and Intercomparison, Lawrence Livermore National Laboratory, Livermore, CA 94550; <sup>b</sup>Remote Sensing Systems, Santa Rosa, CA 95401; <sup>c</sup>Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA 02139; <sup>d</sup>National Center for Atmospheric Research, Boulder, CO 80307; <sup>e</sup>School of Earth and Environmental Sciences, University of Adelaide, Adelaide, SA 5005, Australia; <sup>f</sup>National Aeronautics and Space Administration/Goddard Institute for Space Studies, New York, NY 10025; <sup>g</sup>Canadian Centre for Climate Modelling and Analysis, Environment Canada, Victoria, BC, Canada V8W 2Y2; and <sup>h</sup>Nansen Environmental and Remote Sensing Center, N-5006 Bergen, Norway

Edited by John M. Wallace, University of Washington, Seattle, WA, and approved August 8, 2013 (received for review March 20, 2013)

Since the late 1970s, satellite-based instruments have monitored global changes in atmospheric temperature. These measurements reveal multidecadal tropospheric warming and stratospheric cooling, punctuated by short-term volcanic signals of reverse sign. Similar long- and short-term temperature signals occur in model simulations driven by human-caused changes in atmospheric composition and natural variations in volcanic aerosols. Most previous comparisons of modeled and observed atmospheric temperature changes have used results from individual models and individual observational records. In contrast, we rely on a large multimodel archive and multiple observational datasets. We show that a human-caused latitude/altitude pattern of atmospheric temperature change can be identified with high statistical confidence in satellite data. Results are robust to current uncertainties in models and observations. Virtually all previous research in this area has attempted to discriminate an anthropogenic signal from internal variability. Here, we present evidence that a human-caused signal can also be identified relative to the larger "total" natural variability arising from sources internal to the climate system, solar irradiance changes, and volcanic forcing. Consistent signal identification occurs because both internal and total natural variability (as simulated by state-of-the-art models) cannot produce sustained global-scale tropospheric warming and stratospheric cooling. Our results provide clear evidence for a discernible human influence on the thermal structure of the atmosphere.

climate change detection | climate modeling

**G**lobal changes in the physical climate system are driven by both internal variability and external influences (1, 2). Internal variability is generated by complex interactions of the coupled atmosphere–ocean system, such as the well-known El Niño/Southern Oscillation. External influences include human-caused changes in well-mixed greenhouse gases, stratospheric ozone, and other radiative forcing agents, as well as natural fluctuations in solar irradiance and volcanic aerosols. Each of these external influences has a unique "fingerprint" in the detailed latitude/altitude pattern of atmospheric temperature change (3–8). The use of such fingerprint information has proved particularly useful in separating human, solar, and volcanic influences on climate, and in discriminating between externally forced signals and internal variability (3–7).

We have two main scientific objectives. The first is to consider whether a human-caused fingerprint can be identified against the "total" natural variability ( $V_{TOT}$ ) arising from the combined effects of internal oscillatory behavior ( $V_{INT}$ ), solar irradiance changes, and fluctuations in atmospheric loadings of volcanic aerosols. To date, only one signal detection study (involving hemispheric-scale surface temperature changes) has relied on  $V_{TOT}$  information (9). All other pattern-based fingerprint studies have tested against  $V_{INT}$  (2, 4–7, 10, 11). When fingerprint investigations use information from simulations with natural external forcing, it is typically for the purpose of ascertaining whether

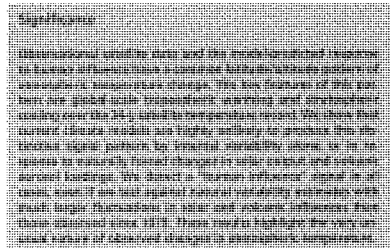
model-predicted solar and volcanic signals are detectable in observational climate records, and whether the amplitude of the model signals is consistent with observed estimates of signal strength (7, 12, 13).

We are addressing a different statistical question here. We seek to determine whether observed changes in the large-scale thermal structure of the atmosphere are truly unusual relative to the best current estimates of the total natural variability of the climate system. The significance testing framework applied here is highly conservative. Our  $V_{TOT}$  estimates incorporate variability information from 850 AD to 2005, and sample substantially larger naturally forced changes in volcanic aerosol loadings and solar irradiance than have been observed over the satellite era.

Our second objective is to examine the sensitivity of fingerprint results to current uncertainties in models and observations. With one exception (11), previous fingerprint studies of changes in the vertical structure of atmospheric temperature have used information from individual models. An additional concern is that observational uncertainty is rarely considered in such work (3–7). These limitations have raised questions regarding the reliability of fingerprint-based findings of a discernible human influence on climate (14).

## Model and Observational Temperature Data

The model output analyzed here is from phase 5 of the Coupled Model Intercomparison Project (CMIP-5) (15). We use atmospheric



Author contributions: B.D.S., C.B., C.A.M., S.S., T.M.L.W., K.E.T., P.W.T., and F.J.W. designed research; B.D.S., J.F.P., C.B., C.A.M., P.J.G., G.A.S., and C.D. performed research; B.D.S., C.B., C.A.M., S.S., T.M.L.W., G.A.S., K.E.T., and P.W.T. analyzed data; B.D.S., C.B., S.S., T.M.L.W., G.A.S., N.P.G., and P.W.T. wrote the paper; and C.A.M. and F.J.W. provided key satellite datasets.

The authors declare no conflict of interest.

This article is a PNAS Direct Submission.

Freely available online through the PNAS open access option.

To whom correspondence should be addressed. E-mail: santer1@llnl.gov.

This article contains supporting information online at [www.pnas.org/lookup/suppl/doi:10.1073/pnas.1305332110/-/DCSupplemental](http://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1305332110/-/DCSupplemental).



temperature changes from simulations with estimated historical changes in these factors: (i) combined human and natural external forcings (ALL); (ii) anthropogenic forcings only (ANT); (iii) combined solar and volcanic forcing only (NAT); (iv) solar forcing only (SOL); and (v) volcanic forcing only (VOL). We also analyze integrations with the following: (vi) estimated changes in solar and volcanic forcing over the past 1,000 y (P1000); (vii) no changes in external influences (CTL); and (viii) 21st century changes in greenhouse gases and anthropogenic aerosols (16) specified according to Representative Concentration Pathway 8.5 (RCP8.5).

We compare simulation output with observed atmospheric temperature changes inferred from satellite-based Microwave Sounding Units (MSUs). Our focus is on zonally averaged temperature changes for three broad layers of the atmosphere: the lower stratosphere (TLS), the mid- to upper troposphere (TMT), and the lower troposphere (TLT) (1). We use observational MSU information from two different groups: Remote Sensing Systems (RSS) (17) and the University of Alabama at Huntsville (UAH) (18). An important aspect of our fingerprint study is its use of additional estimates of observational uncertainty provided by the RSS group (17) (*SI Appendix*).

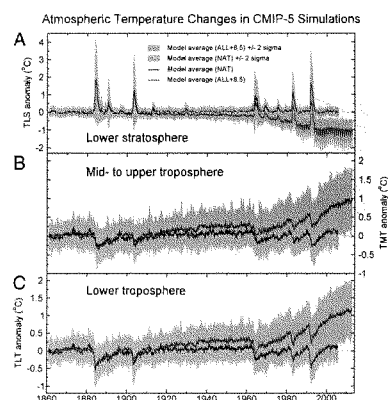
Two processing choices facilitate the comparison of models and observations. First, we calculate synthetic MSU temperatures from CMIP-5 simulations, so that modeled and observed layer-averaged temperatures are vertically weighted in a similar way (10). Second, we splice together temperature information from the ALL and RCP8.5 simulations. The latter are initiated from the end of the ALL simulations, which was generally in December 2005 (*SI Appendix*). Splicing makes it possible to compare modeled and observed temperature changes over the full observed satellite record. We refer to these spliced simulations as "ALL+8.5." (The ANT, NAT, VOL, and SOL integrations also end in December 2005. Unlike the ALL simulation, they cannot be spliced with RCP8.5 results without introducing a discontinuity in forcing.)

#### Global-Mean Temperature Changes

Fig. 1 shows the multimodel average changes in global-mean atmospheric temperature in the NAT and ALL+8.5 simulations. In both types of numerical experiment, the stratosphere warms and the troposphere cools after major volcanic eruptions (1, 4–8, 19, 20). The abrupt TLS warming signals (Fig. 1A) are due to the absorption of incoming solar radiation and outgoing long-wave radiation by volcanic aerosols injected into the stratosphere (21). Stratospheric volcanic aerosols also reduce the clear-sky solar radiation received at Earth's surface, leading to surface and tropospheric cooling. Because of the large thermal inertia of the oceanic mixed layer, the recovery of tropospheric temperature from volcanically induced cooling can take up to a decade (Fig. 1B and C). The removal of volcanic aerosols and the recovery of lower stratospheric temperature is more rapid (~2 y).

The ALL+8.5 simulations exhibit sustained cooling of the lower stratosphere and warming of the troposphere over the past 60 y (Fig. 1). The decrease in TLS is primarily a response to human-caused stratospheric ozone depletion, with a smaller contribution from anthropogenic changes in other greenhouse gases (GHGs) (19, 22, 23). Tropospheric warming is mainly driven by anthropogenic GHG increases (1, 2, 8, 23, 24). In contrast, the NAT runs do not produce large, multidecadal temperature changes (Fig. 1 and *SI Appendix*, Figs. S1 and S2).

After removing the climatological seasonal cycle, lower stratospheric temperature anomalies exhibit a large (post-1970) residual seasonal cycle in the ALL+8.5 simulation, but not in the NAT integration (Fig. 1A). This residual seasonality arises because of the pronounced impact of stratospheric ozone depletion on the seasonal cycle of TLS, particularly at high latitudes in the Southern Hemisphere (25, 26) (*SI Appendix*, Fig. S3).



**Fig. 1.** Time series of simulated monthly mean near-global anomalies in the temperature of the lower stratosphere (TLS), the mid- to upper troposphere (TMT), and the lower troposphere (TLT) (A–C). Model results are from spliced historical/RCP8.5 simulations with combined anthropogenic and natural external forcing (ALL+8.5) and from simulations with natural external forcing only (NAT). The bold lines denote the ALL+8.5 and NAT multimodel averages, calculated with 20 and 16 CMIP-5 models (respectively). Temperatures are averaged over 82.5°N–82.5°S for TLS and TMT, and over 82.5°N–70°S for TLT. Anomalies are defined with respect to climatological monthly means over 1861–1870. The shaded envelopes are the multimodel averages  $\pm 2 \times s(t)$ , where  $s(t)$  is the “between model” SD of the 20 (ALL+8.5) and 16 (NAT) ensemble-mean anomaly time series. To aid visual discrimination of the overlapping ALL+8.5 and NAT envelopes, the boundaries of the ALL+8.5 envelope are indicated by dotted orange lines.

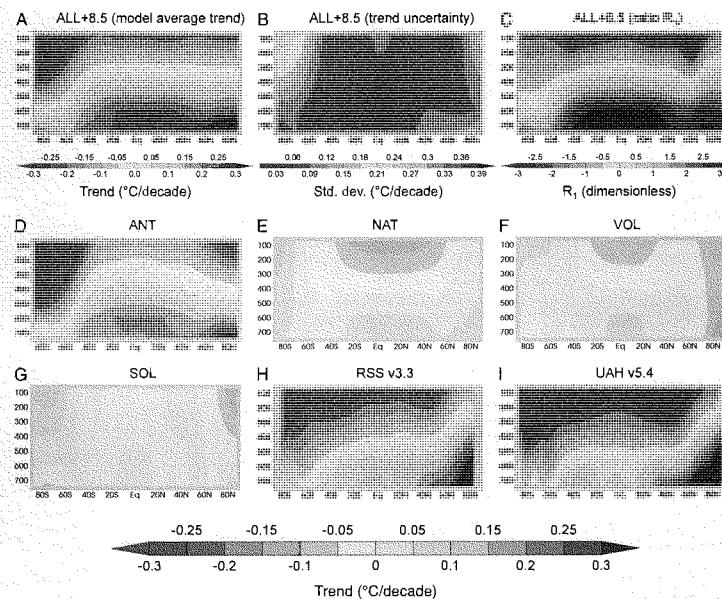
#### Latitude/Altitude Patterns of Temperature Change

Fig. 2 shows the vertical structure of zonal-mean atmospheric temperature trends in the observations and the ALL+8.5, ANT, NAT, VOL, and SOL simulations. Because we perform our subsequent fingerprint analysis in “MSU space,” with only three atmospheric layers (TLS, TMT, and TLT), we use the same MSU space here for visual display of temperature trends. This provides a vertically smoothed picture of temperature changes over the satellite era, while still preserving the principal large-scale features of externally forced signals. [The contouring algorithm used to generate Fig. 2 interpolates temperature information between vertical layers, and between 5° latitude bands (see legend of Fig. 2).]

The ALL+8.5 and ANT multimodel averages (Fig. 2A and D) and the observations (Fig. 2H and I) are characterized by similar patterns of large-scale tropospheric warming and lower stratospheric cooling. In the ALL+8.5 simulations, the most pronounced intermodel differences in temperature trends are in the vicinity of the Antarctic ozone hole (Fig. 2B and *SI Appendix*, Fig. S4), where internal variability is large (10), and there are appreciable intermodel differences in historical ozone forcing (27).

If we use the ratio  $R_1$  as a measure of the size of the multimodel average ALL+8.5 trend relative to the intermodel SD of ALL+8.5 temperature trends, this metric exceeds two over substantial portions of the troposphere and lower stratosphere (Fig. 2C). The  $R_1$  results demonstrate that the ALL+8.5 pattern of tropospheric warming and stratospheric cooling is robust to current uncertainties in external forcings and model temperature responses.

## Zonal-Mean Atmospheric Temperature Trends in CMIP-5 Models and Observations



**Fig. 2.** Zonal-mean atmospheric temperature trends in CMIP-5 models (A and D–G) and observations (H and I). Trends were calculated after first regridding model and observational TLS, TMT, and TLT anomaly data to a  $5^\circ \times 5^\circ$  latitude/longitude grid, and then computing zonal averages. Results are plotted in “MSU space,” at the approximate peaks of the TLS, TMT, and TLT global-mean MSU weighting functions (74, 595, and 740 hPa, respectively). Trends in the RSS and UAH observations and the ALL+8.5 simulations are for the 408 months from January 1979 to December 2012. For the shorter ANT, NAT, VOL, and SOL simulations, trends are over January 1979 to December 2005. The ALL+8.5, ANT, NAT, VOL, and SOL trends are multimodel averages, computed with 20, 8, 16, 2, and 3 models (respectively). B shows a simple measure of model uncertainty in the ALL+8.5 trends:  $s(x, h)$ , the intermodel SD of the 20 individual ensemble-mean trends. The ratio  $R_1$  in C is the ALL+8.5 multimodel average trend in A,  $\bar{s}(x, h)$ , divided by  $s(x, h)$  in B.

Anthropogenic forcing makes the largest contribution to the ALL+8.5 temperature-change pattern (Fig. 2A and D–G). The NAT contribution is relatively small, but augments the anthropogenic signal. Over 1979–2005, the NAT contribution is dominated by volcanic effects, which generate a slight warming trend in the troposphere and a small cooling trend in the stratosphere (SI Appendix, Fig. S5). Because there is little or no trend in solar irradiance over the satellite era, the simulated solar signal is weak.

It is difficult to make more rigorous quantitative comparisons of the temperature changes in the ALL+8.5, ANT, NAT, SOL, and VOL simulations. This difficulty arises because of (i) “between experiment” differences in the number of models and realizations available for estimating multimodel averages (SI Appendix); and (ii) “between model” differences in external forcings (27) and climate sensitivity (28). The information provided in Fig. 2, however, represents our current best multimodel estimate of the

patterns and relative sizes of anthropogenically and naturally forced atmospheric temperature changes over the satellite era.

#### Leading Signal and Noise Patterns

We use a standard fingerprint method (29) to compare model-predicted vertical patterns of zonal-mean atmospheric temperature change with satellite observations (SI Appendix). The searched-for fingerprint is the climate-change signal in response to a set of external forcings. Here, the fingerprint is defined as the first empirical orthogonal function (EOF) of  $\bar{s}(x, h, t)$ , the multimodel average of zonal-mean synthetic MSU temperature changes in the ANT or ALL+8.5 simulations. [The double overbar in  $\bar{s}(x, h, t)$  indicates two averaging steps: an average over ANT or ALL+8.5 realizations of an individual model (if multiple realizations are available) and an average over models.]

As in the observations (Fig. 2 *H* and *I*), both the ANT and ALL+8.5 fingerprints show spatially coherent warming of the troposphere and cooling of the lower stratosphere (Fig. 3 *A* and *B*). The similarity of the ANT and ALL+8.5 fingerprints arises because model trends in atmospheric temperature over the past 30–60 y are primarily driven by anthropogenic influences, with only a small contribution from solar and volcanic forcing (Figs. 1 and 2).

Before presenting the results of our fingerprint analysis, we first examine the major modes of internal and total natural variability (Fig. 3 *C–K*). These are characterized by the leading EOFs calculated from the CTL, NAT, and P1000 simulations (*SI Appendix*). In the first EOF of the CTL simulations, temperature changes in the tropics and extratropics are negatively correlated (Fig. 3*C*). The leading mode in the NAT and P1000 simulations used to estimate  $V_{TOT}$  (Fig. 3 *F* and *I*) captures both the stratospheric warming and tropospheric cooling in response to large volcanic eruptions and part of the internal variability manifest in CTL EOF 1 (Fig. 3*C*). The natural variability modes in Fig. 3 *C–K*

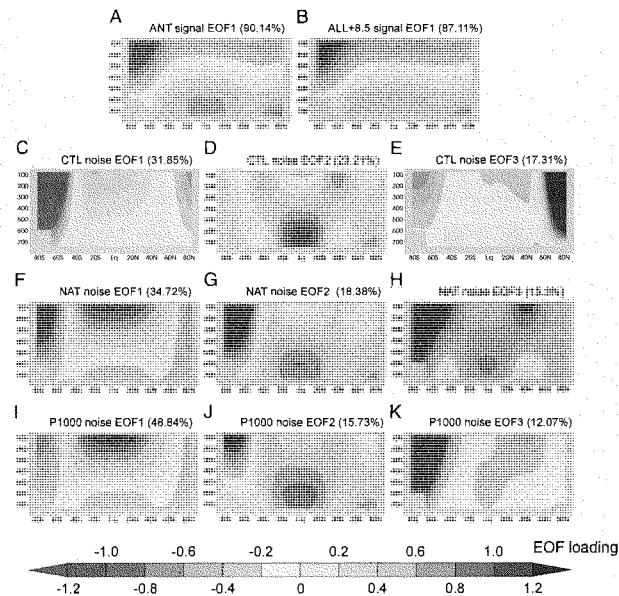
lack the pattern of global-scale tropospheric warming and stratospheric cooling that is evident in the observations (Fig. 2 *H* and *I*) and the ANT and ALL+8.5 fingerprints (Fig. 3 *A* and *B*).

#### Fingerprint Results

We consider next the detectability of the ANT fingerprint. If the amplitude of the fingerprint pattern  $F(x, h)$  is increasing in  $O(x, h, t)$ , the time-varying observations, there will be a positive trend in  $c(F, O)(t)$ , the covariance statistic that measures the spatial similarity between  $F(x, h)$  and  $O(x, h, t)$  (*SI Appendix*). [The indices  $x$ ,  $h$ , and  $t$  are (respectively) over the total number of latitude bands, atmospheric layers, and time (in years).] These “signal trends,”  $b(L)$ , are a function of the analysis period  $L$ , which spans lengths of 10–34 y (i.e., from 1979–1988 to 1979–2012).

As  $L$  increases, the spatial similarity between  $O(x, h, t)$  and the ANT fingerprint decreases initially due to the stratospheric warming and tropospheric cooling caused by the 1991 Pinatubo eruption (Fig. 4*A*). This reduces the magnitude of  $b(L)$  values.

#### Leading Signal and Natural Variability Modes in CMIP-5 Models



**Fig. 3.** Leading signal and natural variability modes for the vertical structure of atmospheric temperature change in CMIP-5 simulations. All signal and natural variability modes were calculated after first transforming annual-mean synthetic TLS, TMT, and TLT data to a common  $5^\circ \times 5^\circ$  latitude-longitude grid, and then computing zonal averages. The leading signal modes are the first EOFs of the multimodel atmospheric temperature changes in the ANT and ALL+8.5 simulations (A and B, respectively). Multimodel averages were calculated over 1861–2012 for the ALL+8.5 case, and over 1861–2005 for the shorter ANT simulations, using results from 20 ALL+8.5 models and 8 ANT models. The leading natural variability modes are EOFs 1, 2, and 3 of the 20 concatenated preindustrial control runs (CTL; C–E), the 16 concatenated simulations with estimates of historical changes in solar and volcanic forcing over 1850–2005 (NAT; F–H), and the 5 concatenated integrations with natural external forcing over 850–1700 (P1000; I–K). The percentage variance explained by each mode is given in parentheses. See *SI Appendix* for further analysis details.

During the recovery phase after Pinatubo, signal trends increase until  $L = 20$  years. Subsequently, following the large tropospheric warming caused by the 1977/1998 El Niño, the amplitude of  $b(L)$  gradually decreases. This decrease is due to changes in observed rates of stratospheric cooling and troposphere warming (10, 30).

The crux of the fingerprint identification problem is to assess whether these signal trends are statistically significant. We use signal-to-noise (S/N) ratios to make this determination. To estimate the denominator of the S/N ratio, we require "null" (no signal) distributions for trends of length  $L$  years. Conventionally, these distributions are obtained using internal variability information from many  $L$ -year segments of CTL simulations. Here, we also consider the additional variability arising from solar and volcanic forcing, which we estimate using both the NAT integrations and the longer P1000 runs. This gives us three different sets of natural variability estimates and S/N ratios (Fig. 4B and C; green, blue, and red curves).

We obtain "no signal" distributions by comparing  $F(x, h)$  with  $N(x, h, t)$ , the temperature changes from the concatenated CTL, NAT, or P1000 integrations. This yields long time series of the pattern similarity statistic  $c(F, N)(t)$ , from which the null distributions can be calculated for varying trend lengths. These distributions have means close to zero and standard deviations  $s(L)$  that decrease by a factor of roughly 5 as  $L$  increases from 10 to 34 y (Fig. 4B).

The S/N ratio that we use for assessing the statistical significance of signal trends is simply given by  $b(L)/s(L)$  (Fig. 4C). [For  $L = 10$ , therefore,  $b(L)$  is calculated over 1979–1988, and  $s(L)$  is computed from the distribution of nonoverlapping 10-y trends in  $c(F, N)(t)$ .] S/N ratios generally increase with longer analysis periods, primarily because of the decrease in  $s(L)$  with larger values of  $L$ . With CTL noise, S/N ratios for signal trends computed over 1979–2012 are invariably significant at the 1% level or better, and range from 8.4 to 10.7, depending on the choice of observational dataset.

Consider next the S/N results for tests against  $V_{TOT}$ . The NAT simulations provide estimates of how atmospheric temperature might have evolved in the absence of human intervention, but in the presence of stochastic temperature changes arising from internal variability and deterministic changes caused by solar and volcanic forcing. One possible significance testing strategy is to restrict our estimate of  $V_{TOT}$  to the period of overlap between the NAT runs and the satellite data sets (1979–2005). This strategy has two disadvantages: (i) we have only 16 NAT models with samples of naturally forced temperature change over 1979–2005; and (ii) each of these samples includes only two major volcanic eruptions (El Chichón and Pinatubo).

Here, we estimate  $V_{TOT}$  over 1861–2005, and thus do not require that the simulated and observed evolution of volcanic forcing is identical. By using this longer period, we include the effects of four additional major eruptions in the presatellite era (Kinkaku in 1883, Soufrière/Pelee/Santa Maria in 1902, Novarupta in 1912, and Agung in 1963) and obtain many more samples of the temperature response to volcanic forcing. This increase in sample size is advantageous in assessing the likelihood of obtaining the observed signal trends by total natural variability alone.

As expected, trends computed from the NAT simulations are generally larger than those obtained from the CTL runs (Fig. 4B). This holds for all timescales examined here. Despite the increase in the size of the denominator, S/N ratios remain highly significant for signal trends calculated over the full satellite record, ranging from 3.7 to 4.8 (Fig. 4C). It is unlikely that these values are spuriously inflated by a systematic underestimate of total natural variability in the CMIP-5 models analyzed here (10).

Although there are large uncertainties in the solar and volcanic forcings used in the six P1000 runs (31), these simulations provide our best current estimates of the magnitude and patterns of naturally forced atmospheric temperature change over the period from 850 to 1849 (SI Appendix, Fig. S6). As in the case of the NAT simulations, we use P1000  $V_{TOT}$  estimates to determine whether an anthropogenic fingerprint can be identified relative to

#### Signal Trends, Noise Trends, and S/N Ratios

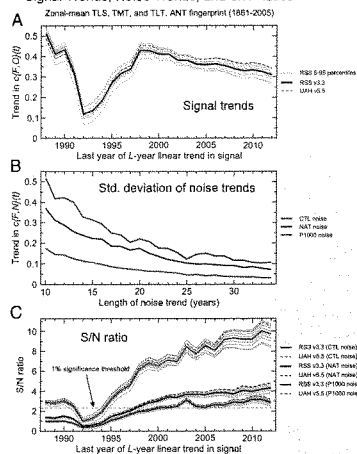


Fig. 4. Results from the S/N analysis of simulated and observed changes in zonal-mean TLS, TMT, and TLT. Signal time series provide information on the similarity between the time-invariant ANT fingerprint pattern (Fig. 3A) and the time-varying observed patterns of zonal-mean atmospheric temperature change. Values of  $b(L)$ , the  $L$ -year trends in these signal time series, are plotted in A. Noise time series indicate the level of similarity between the ANT fingerprint and the CTL, NAT, and P1000 estimates of variability. B shows  $s(L)$ , the SD of the distribution of nonoverlapping  $L$ -year trends in the CTL, NAT, and P1000 noise time series. The S/N ratio between  $b(L)$  and  $s(L)$  is given in C. The thin solid lines in C are the S/N ratios for signal trends obtained with the R50–R95 percentiles. The nominal 1% significance level assumes a Gaussian distribution of noise trends. The ANT fingerprint was calculated using the multimodel average zonal-mean changes in atmospheric temperature over 1861–2005 (SI Appendix). Signal and noise trends in A and B have units of  $c(F, D)/\text{decade}$  and  $c(F, N)/\text{decade}$ , respectively.

total natural variability levels that are substantially larger than those actually sampled over the satellite era.

In addition to solar and volcanic forcing, the P1000 simulations include anthropogenic changes in GHGs and land use (31). To avoid appreciable anthropogenic contamination,  $V_{TOT}$  values were calculated using synthetic MSU temperatures for 850–1700 only. This period contains at least two massive volcanic eruptions—an unknown eruption in 1259, and Kuwae in 1452. Each event is estimated to have produced larger stratospheric sulfate aerosol loadings than those of any eruption during the NAT simulation period (32). This explains why the P1000 levels of total natural variability are consistently higher than those computed with NAT simulations (Fig. 4B). Even with these very large P1000  $V_{TOT}$  values, we still obtain ubiquitous detection of an anthropogenic fingerprint in the observations, with S/N ratios ranging from 2.5 to 3.2 for 34-y trends (Fig. 4C).

#### Sensitivity Tests

We performed a number of additional sensitivity studies to explore the robustness of these results. The first involved use of the

ALL+8.5 rather than the ANT fingerprint. Because of the spatial similarity of these fingerprints, they yield similar S/N ratios (Fig. 4 and *SI Appendix*, Fig. S7). In a second test, we repeated the entire fingerprint analysis with zonal-mean changes in TLS and TLT only. Temperature changes have more favorable S/N characteristics in the lower stratosphere than in the troposphere (10), so removal of zonal-mean TMT changes substantially increases S/N ratios (*SI Appendix*, Fig. S8). In our third test, ALL+8.5 and ANT fingerprints were estimated over the satellite era only (rather than over the full period of these simulations). Use of a shorter period for fingerprint estimation still preserves the large-scale features of tropospheric warming and stratospheric cooling (Fig. 2*A* and *D*), so fingerprint detection is insensitive to this analysis choice.

One area of concern is that, on average, the ALL+8.5 simulations underestimate the observed lower stratospheric cooling and overestimate tropospheric warming (compare Fig. 2*A* with Fig. 2*H* and *I*). These differences must be due to some combination of errors in model forcings (27, 33–35), model response errors (36), residual observational inhomogeneities (17), and an unusual manifestation of natural internal variability in the observations (10, 30). Because of the bias in tropospheric warming, most individual models have S/N ratios that are larger than those obtained with observations (*SI Appendix*, Fig. S9).

### Conclusions

Our analysis of the latest satellite datasets and model simulations reveals that a model-predicted anthropogenic fingerprint pattern

is consistently identifiable, with high statistical confidence, in the changing thermal structure of the atmosphere. Multidecadal tropospheric warming and lower stratospheric cooling are the main features of this fingerprint. Tests against NAT and P1000 “total” natural variability ( $V_{TOT}$ ) demonstrate that observed temperature changes are not simply a recovery from the El Chichón and Pinatubo events, and/or a response to variations in solar irradiance. The significance testing framework used here is highly conservative—the NAT and P1000 estimates of  $V_{TOT}$  include volcanic eruptions and solar irradiance changes much larger than those observed over the satellite era. Our results are robust to current uncertainties in models and observations, and underscore the dominant role human activities have played in recent climate change.

**ACKNOWLEDGMENTS.** We acknowledge the World Climate Research Programme’s Working Group on Coupled Modelling, which is responsible for CMP, and we thank the climate modeling groups (listed in *SI Appendix*, Table S1) for producing and making available their model output. For CMP, the Department of Energy (DOE) Program for Climate Model Diagnosis and Intercomparison (PCMDI) provides coordinating support and led development of software infrastructure in partnership with the Global Organization for Earth System Science Portals. Helpful comments and advice were provided by Jim Boyle (PCMDI), Kerry Emanuel (Massachusetts Institute of Technology), and Mike MacCracken. At Lawrence Livermore National Laboratory, work by B.D.S., J.F.P., P.J.G., and K.E.T. was performed under the auspices of the DOE under Contract DE-AC52-07NA27344. C.B. was supported by the DOE/Office of Biological and Environmental Research (OBER) Early Career Research Program Award SCW1295; and C.D. was funded under DOE/OBER Contract DE-AC52-07NA27344.

- Karl TR, Hassel SJ, Miller CD, Murray WL (eds) (2006) *Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research* (National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, NC).
- Hegerl GC, et al. (2007) Understanding and attributing climate change. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds Solomon S, et al. (Cambridge Univ Press, Cambridge, UK).
- Karoly DJ, et al. (1994) An example of fingerprint detection of greenhouse climate change. *Clim Dyn* 10:97–105.
- Santer BD, et al. (1996) A search for human influences on the thermal structure of the atmosphere. *Nature* 382:39–46.
- Vinnikov KY, Robock A, Stouffer RJ, Manabe S (1996) Vertical patterns of free and forced climate variations. *Geophys Res Lett* 23:1801–1804.
- Tett SFB, Mitchell JFB, Parker DE, Allen MR (1996) Human influence on the atmospheric vertical temperature structure: Detection and observations. *Science* 274:15290:1170–1173.
- Thorne PW, et al. (2002) Assessing the robustness of zonal mean climate change detection. *Geophys Res Lett* 29(19):1920, 10.1029/2002GL015717.
- Hansen JE, et al. (2005) Efficacy of climate forcings. *J Geophys Res* 110:D18104, 10.1029/2005JD005776.
- Hegerl GC, et al. (2007) Detection of human influence on a new, validated 1500-year temperature reconstruction. *J Clim* 20:650–666.
- Santer BD, et al. (2013) Identifying human influences on atmospheric temperature. *Proc Natl Acad Sci USA* 110(1):26–33.
- Lott FC, et al. (2013) Models versus radiosondes in the free atmosphere: A new detection and attribution analysis of temperature. *J Geophys Res* 118:2609–2619.
- Tett SFB, et al. (2002) Estimation of natural and anthropogenic contributions to twentieth century temperature change. *J Geophys Res* 107:D15, 10.1029/2000JD000028.
- Gillett NP, et al. (2011) Attribution of observed changes in stratospheric ozone and temperature. *Atmos Chem Phys* 11:599–609.
- Curry JA, Webster PJ (2011) Climate science and the uncertainty monster. *Bull Am Meteorol Soc* 92(12):1667–1682.
- Taylor KE, Stouffer RJ, Meehl GA (2012) An overview of CMIP5 and the experiment design. *Bull Am Meteorol Soc* 93(4):485–498.
- Meirshausen M, et al. (2011) The RCP greenhouse gas concentrations and their extensions from 1765 to 2300. *Clim Change* 109(1–2):213–241, 10.1007/s10584-011-0156-z.
- Mears G, Wentz FJ, Thorne P, Bernie D (2011) Assessing uncertainty in estimates of atmospheric temperature changes from MSU and AMSU using a Monte-Carlo technique. *J Geophys Res* 116:D08112, 10.1029/2010JD014954.
- Christy JR, Norris WB, Spencer RW, Hnilo JJ (2007) Tropospheric temperature change since 1979 from tropical radiosonde and satellite measurements. *J Geophys Res* 112:D08102, 10.1029/2005JD006881.
- Ramaswamy V, et al. (2006) Anthropogenic and natural influences in the evolution of lower stratospheric cooling. *Science* 311(5764):1138–1141.
- Wigley TML, Ammann CM, Santer BD, Raper SCB (2005) The effect of climate sensitivity on the response to volcanic forcing. *J Geophys Res* 110:D09107, 10.1029/2004JD005557.
- Ramaswamy V, et al. (2001) Stratospheric temperature trends: Observations and model simulations. *Rev Geophys* 39:71–122.
- Seidel DJ, Gillett NP, Lanzante JR, Shine KP (2011) Stratospheric temperature trends: Our evolving understanding. *Wiley Interdiscip Rev* 2:592–616, 10.1002/wcc.125.
- Santer BD, et al. (2003) Contributions of anthropogenic and natural forcing to recent tropopause height changes. *Science* 301(5632):479–483.
- Thorne PW, Lanzante JR, Peterson TC, Seidel DJ, Shine KP (2011) Tropospheric temperature trends: History of an ongoing controversy. *Wiley Interdiscip Rev* 2:66–88, 10.1002/wcc.80.
- Thompson DWJ, et al. (2011) Signatures of the Antarctic ozone hole in Southern Hemisphere surface climate change. *Nat Geosci* 4:741–749.
- Gillett NP, Thompson DWJ (2003) Simulation of recent southern hemisphere climate change. *Science* 302(5643):273–275.
- Eyring V, et al. (2013) Long-term changes in tropospheric and stratospheric ozone and associated climate impacts in CMIP5 simulations. *J Geophys Res* 118:5029–5060.
- Andrews T, Gregory JM, Webb MJ, Taylor KE (2012) Forcing, feedbacks and climate sensitivity in CMIP5 coupled atmosphere-ocean climate models. *Geophys Res Lett* 39:L09712, 10.1029/2012GL016007.
- Hasselmann K (1979) Do the signal-to-noise problem in atmospheric response studies. *Meteorology of Tropical Oceans*, ed Shaw DB (Royal Meteorological Society, London), pp 251–259.
- Santer BD, et al. (2011) Separating signal and noise in atmospheric temperature changes: The importance of timescale. *J Geophys Res* 116:D22105, 10.1029/2011JD016263.
- Schmidt GA, et al. (2012) Climate forcing reconstructions for use in PMIP simulations of the Last Millennium. *Geosci Model Dev* 5:185–191.
- Gao C, Oman L, Robock A, Stenchikov G (2007) Atmospheric volcanic loading derived from bipolar ice cores: Accounting for the spatial distribution of volcanic deposition. *J Geophys Res* 112:D09109, 10.1029/2006JD007461.
- Solomon S, et al. (2010) Contributions of stratospheric water vapor to decadal changes in the rate of global warming. *Science* 327(5970):1219–1223.
- Solomon S, et al. (2011) The persistently variable “background” stratospheric aerosol layer and global climate change. *Science* 333(6046):866–870.
- Solomon S, Young PJ, Hasler B (2012) Uncertainties in the evolution of stratospheric ozone and implications for recent temperature changes in the tropical lower stratosphere. *Geophys Res Lett* 39:L17706, 10.1029/2012GL052723.
- Trenberth KE, Fasullo JT (2010) Simulation of present-day and twenty-first-century energy budgets of the Southern Ocean. *J Clim* 23(2):440–454, 10.1175/2009JC13152.1.

Mr. WHITFIELD. And I also would like to put in the record your photo of how ice has expanded by almost a million square miles in the last year in the Arctic Circle.

Mr. WAXMAN. Reserving the right to object. And I would like to be recognized on my reservation.

Mr. WHITFIELD. Absolutely, recognized.

Mr. WAXMAN. Well, Mr. Chairman, I think this illustrates why we need a committee where we bring in the scientists. I just thought the statements that the gentleman from West Virginia read to us were incredibly inaccurate and contrary to everything else everybody in the scientific community has to say, including Secretary Moniz, who is an MIT professor for 40 years, he was the Department of Physics' head of the Linear Accelerator Center, undersecretary of DOE, a Ph.D. in theoretical physics from Stanford University. We need scientists to come in here and talk about science, not—

Mr. WHITFIELD. So, Mr. Waxman, are you objecting to this?

Mr. WAXMAN. Well, I just want to make that point but I will not object.

Mr. WHITFIELD. OK. Well, I won't object to yours, either.

And at this time I would like to recognize Dr. Christensen from the Virgin Islands for 5 minutes.

Mrs. CHRISTENSEN. Thank you, Mr. Chairman. And I am really glad we are having this hearing.

And of course I support President Obama's sensible plan to address climate change by reducing carbon pollution and helping communities to prepare for the impacts of climate change.

In reading your testimony and hearing your testimony I applaud the open approach to setting the standards that has been engaging and will engage all of the stakeholders and their concern in the process. Despite this, we continue to hear a lot of criticism of the President's plan from our Republican colleagues, and like our Ranking Member Waxman, I would simply ask, what is their plan? The President has said he is willing to work with anyone who wants to propose alternatives. And I am glad that if Congress won't act, he will. And I am also glad that both of you included in your testimony that the economy also benefits from the prior responses, has benefited from prior responses to climate change.

My district in the U.S. Virgin Islands and the other territories are really on the forefront of this issue of climate change. And like our panelists from the Safe Climate Caucus forum yesterday are already experiencing the impact of that change. In the Virgin Islands, we have already endured a serious coral reef bleaching event that significantly impacted our fisheries, and by extension, our tourism product and our economic stability. If we were to continue to do nothing, we could expect increased ocean acidification, sea level rise, which will impact our coastal infrastructure, and of course more intense storms, as much of the country is experiencing.

So it is absolutely and abundantly clear that climate change is real and that we have to act. And it is important also, as was discussed with Congresswoman Matsui, that our country lead on this really vital issue.

But as we respond, we also have to make sure that we transition to cleaner energy sources in a way that is workable, especially for

communities with the greatest economic challenges. In the Virgin Islands and the other territories, we rely still very heavily on diesel generation, and at 53 cents per kilowatt today, electricity prices are the highest in our country. So we really have a strong incentive to scale up affordable renewable energy and energy efficiency, but it is going to take some time.

So, Administrator McCarthy, I think you have answered my first question. I think you have made it clear that the rule you propose on Friday will apply only to new power plants, correct?

Ms. MCCARTHY. That is correct.

Mrs. CHRISTENSEN. And next, you would start to work on a rule to reduce carbon pollution from existing power plants?

Ms. MCCARTHY. Yes.

Mrs. CHRISTENSEN. So it is going to be particularly important for my constituents that we find cost-effective solutions that work for our specific circumstances and I think the same is true for all of the territories and the State of Hawaii given the high prices that we are already paying and the challenges related to being an island and where we are located.

So I also have read in your testimony that you plan to work with the States and the territories to ensure that you understand our specific circumstances as we do these things. So under the provisions of the Clean Air Act, do States and territories have the flexibility to achieve carbon pollution goals in ways that work for them? Do you anticipate that that flexibility will be there?

Ms. MCCARTHY. That is correct.

Mrs. CHRISTENSEN. OK. And, Secretary Moniz, as we look to the future of our energy supply system, do you see promising technology-based solutions that will allow places like the Virgin Islands and the other territories to meet our electricity needs with clean as well as affordable power? And what do you see as the most promising areas?

Mr. MONIZ. Um-hum. Yes, I do and I also recognize that in fact islands often have the biggest challenge in that combination of risk and high energy prices. That is where, first of all, I think not being dependent upon particularly oil imports is very important, and that is where renewables can be very important. And also I think there is at least one advantage in an island setting and that is transportation based upon electricity and/or natural gas can be more attractive because the driving range issues are not as important. So I think there is a real future for green islands and we would be delighted to work with you on that.

Mrs. CHRISTENSEN. Where are we with ocean thermal conversion?

Mr. MONIZ. With ocean conversion—

Mrs. CHRISTENSEN. It seems like it would be a good source.

Mr. MONIZ. Yes, and so we continue to do research on that. That is a case where if you saw that curve that was shown earlier with cost dropping and deployment, we are still in the early stage of that curve. There is still a ways to go in terms of cost reduction. But the research is going on and there are some pilot projects in various parts of the world.

Mrs. CHRISTENSEN. Thank you. My time is up. Thank you, Mr. Chairman.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time I recognize the gentleman from Kansas, Mr. Pompeo, for 5 minutes.

Mr. POMPEO. Great. Thank you, Mr. Chairman.

Ms. McCarthy, I want to ask a couple of questions of you. So one of the objectives today is to identify greenhouse gas regulations that already existed and those in the future and how they actually impact the climate change, right? So you would agree that we want to make sure we have a successful climate policy as a result of those sets of rules and regulations that you promulgate, fair? Fair baseline statement?

Ms. MCCARTHY. In the context of a larger international effort, yes.

Mr. POMPEO. You bet. And on your Web site you have 26 indicators used for tracking climate change. They identify various impacts of climate change so you would believe that the purpose of these rules is to impact those 26 indicators, right? So if you put a good greenhouse gas rule in place, you will get a good outcome on at least some or all of those 26 indicators?

Ms. MCCARTHY. I actually think that the better way to think about it, if I might, is that it is part of an overall strategy that is positioning the U.S. for leadership in an international discussion because climate change requires a global effort. So this is one piece and it is one step, but I think it is a significant one to show the commitment of the United States.

Mr. POMPEO. Makes perfect sense, but you think it would be reasonable to take the regulations you promulgate and link them to those 26 indicators the you have on your Web site and say this is how they impacted them?

Ms. MCCARTHY. It is unlikely that any specific one step is going to be seen as having a visible impact on any of those impacts, a visible change in any of those impacts. What I am suggesting is that climate change has to be a broader array of actions that the U.S. and other folks in the international community take that make a significant effort towards reducing greenhouse gases and mitigating the impacts of climate.

Mr. POMPEO. But these are your indicators, Ms. McCarthy, so these are——

Ms. MCCARTHY. They are indicators of climate change. They are not——

Mr. POMPEO. Right. Precisely.

Ms. MCCARTHY [continuing]. Directly applicable to performance impacts of any one action.

Mr. POMPEO. How about the cumulative impact of your actions? Certainly, you are acting in a way, you say these are the indicators of climate change. It certainly can't be the case that your testimony today is that your cumulative impact of your current set of regulations and those you are proposing isn't going to have any impact at all on any of those indicators?

Ms. MCCARTHY. I think that the President was very clear what we are attempting to do is put together a comprehensive climate plan across the administration that positions the U.S. for leadership on this issue and that will prompt and leverage international discussions and actions.



Mr. POMPEO. So you are putting regulations in place for the purpose of leadership but not to impact the indicators that you, the EPA, says are the indicators of climate change? I am deeply puzzled by that.

Ms. MCCARTHY. Congressman, we are working within the authority that Congress gave us to do what we can, but all I am pointing out is that much more needs to be done and it needs to be looked at in that larger context.

Mr. POMPEO. So in 2010—it is in your opening statement—we have gotten rid of a whole bunch of greenhouse gas, about 6 billion metric tons. For example, one of your indicators is heat-related deaths. How many heat-related deaths have been eliminated as a result of the 2010 NHTSA rules?

Ms. MCCARTHY. You can't make those direct connections, Congressman; neither can I.

Mr. POMPEO. Right. So there is literally no connection to the activities you are undertaking and to the—

Ms. MCCARTHY. I did not say that.

Mr. POMPEO. Well, you said you couldn't make the connection, so tell me what I am misunderstanding. Can you draw connections between the rules you are providing, the regulations you are promulgating and your indicators or is it just on a—

Ms. MCCARTHY. I think what you are asking is can EPA in and of itself solve the problems of climate change. No, we cannot. But the authority you gave us—

Mr. POMPEO. Right.

Ms. MCCARTHY [continuing]. Was to use the Clean Air Act to regulate pollution. Carbon pollution is one of those regulated—

Mr. POMPEO. Right.

Ms. MCCARTHY [continuing]. Pollutants and we are going to move forward with what we can do—

Mr. POMPEO. Yes.

Ms. MCCARTHY [continuing]. Is reasonable and appropriate.

Mr. POMPEO. I am actually not asking that question that you suppose that I am asking.

Ms. MCCARTHY. OK. I am sorry.

Mr. POMPEO. I didn't ask if you had the capacity to solve greenhouse gas issues. What I asked was is anything you are doing doing any good as measured by the indicators that you have provided for—so is your testimony today that you just have no capacity to identify whether the actions EPA has undertaken has any impact on those indicators? This is about science—

Ms. MCCARTHY. Yes.

Mr. POMPEO [continuing]. Cause-and-effect. Is there any causal relationship between the regulations you have promulgated and the 26 indicators of climate change that you have on your Web site?

Ms. MCCARTHY. The indicators on the Web site are broad global indicators—

Mr. POMPEO. They are not broad; they are very specific.

Ms. MCCARTHY [continuing]. Of impacts associated with climate change. They are not performance requirements or impacts related to any particular act.

Mr. POMPEO. I actually like the indicators. They are quantifiable.

Ms. MCCARTHY. They are great.

Mr. POMPEO. Heat-related deaths, change in ocean heat——

Ms. MCCARTHY. Yes.

Mr. POMPEO [continuing]. Sea level rises, snow cover——

Ms. MCCARTHY. Yes.

Mr. POMPEO [continuing]. Those are great, quantifiable things but——

Ms. MCCARTHY. Yes.

Mr. POMPEO [continuing]. Now what you are telling me is——

Ms. MCCARTHY. They indicate the public health impacts associated with——

Mr. POMPEO. Exactly.

Ms. MCCARTHY [continuing]. Climate change. Yes.

Mr. POMPEO. But what you are telling me is you can't link up your actions at EPA to any benefits associated with those quantifiable indicators that the EPA itself has proposed as indicative of climate change?

Ms. MCCARTHY. I think what we are able to do is to show—and I hope we will show this in the package that we put out for comment—is what kind of reductions are going to be associated with our rules, what we believe they will have in terms of an economic and a public health benefit. But it again is part of a very large strategy.

Mr. POMPEO. Awesome. My time is up. Thank you.

Mr. MONIZ. If I may just——

Mr. WHITFIELD. The gentleman's time is expired. At this time I recognize the gentlelady from—I am sorry. Did you have a comment?

Mr. MONIZ. Well, I was going to comment briefly that there is academic literature that does associate extremely hot days with mortality, and I would be happy to provide that paper.

Mr. POMPEO. That would be great. Thank you.

Mr. WHITFIELD. At this time I recognize the gentlelady from Florida, Ms. Castor, for 5 minutes.

Ms. CASTOR. Well, thank you, Mr. Chairman, and thank you very much for calling this hearing on the Obama Administration's Climate Action Plan. And, Administrator McCarthy, thank you very much for your leadership and willingness to assume the challenges as EPA administrator and it is good to see you today. And, Secretary Moniz, same goes for you. Thank you for being here.

Now, my Republican colleagues' arguments today relating to carbon pollution and the changing climate are reminiscent of their arguments and the arguments of special interests in the past when it comes to updating our standards relating to pollution and health standards and a clean environment. They predicted as they always do we are going to have a rise in unemployment; the unemployment rate is going to skyrocket. They predict the economy will go into a tailspin if America tackles pollution and climate problems. It is an argument they raise every time America acts to set better standards for air, for water, for children's health.

All you have to do is think back to the 1970s. I am old enough to remember what the mornings were like before the Clean Air Act and how smoggy it was when you would come out of your house and you could smell it and taste it. And then the country had the wherewithal to adopt the Clean Air Act. And over decades, our air

has improved. Same can be said in the 1990s when it comes to acid rain. It can be said how America tackled the problem of chlorofluorocarbons that were depleting the ozone layer. The same can be said when it comes to cancer-causing chemicals in plastic. Plastic industry did not collapse, did it? There is probably more plastic around today than ever before.

So I would say to my Republican colleagues: have confidence in America's ability to innovate in the face of significant challenges, challenges like climate change. And coming from a vulnerable State like Florida, I think what we see clearly ahead of us is there is a greater cost to an action.

Look at what citizens across my State and all across the country will face in rising insurance premiums when it comes to extreme event. We are debating flood insurance right now. And that is going to be tied more and more to the changing climate and sea level rise in the future. Think about what local governments and communities are going to have to do to invest in infrastructure. In the State of Florida we are investing a great deal now to protect our clean water supply and the drinking water supply from the rising bays and oceans that are going to intrude on the drinking water supply, the saltwater intrusion. Communities are having to invest now to protect infrastructure, just the plain old pipes under the ground that we need to operate as a normal community all up and down the coast.

So I see in the face of more droughts, more floods, longer fire seasons, more intense fires, faster sea level rise, it is very important that we take action. The costs ahead of us will be inordinate if the Congress continues to ignore it. So I am glad that the Administration is taking leadership here.

Secretary Moniz and Administrator McCarthy, in general, let's talk about cost and benefits. When you propose a major rule, you are legally required to analyze the cost and the benefits of that rule, isn't that correct?

Ms. MCCARTHY. Yes.

Ms. CASTOR. In fact, hasn't cost-benefit analysis been required for agency rulemaking ever since President Reagan signed an Executive Order on cost-benefit analysis in 1981?

Ms. MCCARTHY. That is my understanding, yes.

Ms. CASTOR. And it is called cost-benefit analysis because you are required to estimate both the cost and the benefits of government action, is that correct?

Ms. MCCARTHY. That is correct.

Ms. CASTOR. If you didn't look at both the costs and the benefits, the information wouldn't help you assess the merits of a rule. If you only looked at cost, no rule would ever be worth it. In fact, Mr. Secretary, DOE recently issued a rule to require microwave ovens to be more energy efficient. As part of that rulemaking, DOE was required to estimate the cost and benefits of the new standards by reducing the use of electricity. The rule will reduce air pollution, including carbon pollution. That is one of the benefits of the rule, isn't that right? Did the rule include an estimate of cost of the carbon pollution that would be avoided by the rule?

Mr. MONIZ. Yes, it did. And indeed, the need to do that comes from a court ruling in 2007.

Ms. CASTOR. And how did you get to that number? Was it developed through an interagency process and was it based on peer-reviewed science?

Mr. MONIZ. Yes, the process formally started in 2009. It is based upon three highly peer-reviewed models. There has been transparency on the models back in 2009/2010, every rulemaking that also opens up for comments going forward. The recent change in the numbers was strictly updating the peer-reviewed models using them with the same inputs used previously.

Ms. CASTOR. Thank you.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time I recognize the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. LATTI. Well, thanks very much, Mr. Chairman, and thanks very much for having the hearing today. And I also want to thank the Secretary and the Administrator for being with us today. I have appreciated the comments today.

And, Mr. Secretary, if I could start with a question to you. As the chairman had earlier stated in his opening remarks, when the President came into office, Congress took into consideration what was essentially his climate plan. Congress considered whether we would embark on a complicated and expensive regulatory program that was intent on massively decarbonizing our energy supply and raising our energy costs. And we were told the U.S. must take the lead.

Mr. Secretary, do you think it is economically wise for the U.S. to unilaterally implement policies that will result in more expensive energy costs for American households in manufacturing? And this question is really important for a district like mine because I have 60,000 manufacturing jobs. And I spend all my time on the road going through large meetings, small plants across my district. And what was happening here in Washington affects these plants and it affects jobs back home. So, again, do you think it is economically wise for the U.S. to unilaterally implement policies that can result in more expensive energy for these manufacturing facilities and for American households?

Mr. MONIZ. First of all, in no small part due to the shale gas boom, we are actually seeing lower costs in many, many industries and a growth in many—

Mr. LATTI. Well, if I could just interrupt for a minute because in the State of Ohio 70 percent of our energy is coal-based.

Mr. MONIZ. Yes. Again, across the country certainly we are seeing more manufacturing, lower energy prices, and in fact in Ohio there is also the issue of developing shale gas now.

Secondly, in terms of the U.S. moving forward, I would say that, number one, American leadership is indispensable if we are going to have international action. But secondly, there is very much, I believe, the self-serving interest of developing the new technologies that will in fact give us a strong position in a future multitrillion-dollar market.

Mr. LATTI. OK. Continuing on with that, if I could just continue on with the questions to you. Again, in the Climate Action Plan and also in your testimony, we are talking about the three pillars that you mentioned, and the third point being that the United

States needs to lead the international effort. And especially when we are talking about the climate issues, what does the Administration mean by the U.S. taking that leadership role and does this mean that we are supposed to be the first nation that decarbonizes our energy supply on a very large scale and expects the rest of the world to follow? Or what is that leadership?

Mr. MONIZ. I would say it means that, first of all, we do lead in clean energy and I believe we do lead for sure in clean energy innovation. We have to help deploy it. We are working, for example, the Department of State in terms of the—if you like the policy level—has made tremendous progress in the G-20 context and with China in terms of HFCs. And at the Department of Energy we are working through a variety of mechanisms.

For example, we lead what is called the Clean Energy Ministerial, which is advancing dialogues with other countries. For example, in many countries now we have active dialogues going on where our companies are working with companies in those countries. I will mention countries I have been in, Brazil, for example, recently, yesterday in Vienna, Monday with Turkey, et cetera. They are very interested in our technologies for industrial energy efficiency. This is a market for our companies to go out there, both services and technology. That is what we mean by leading.

Mr. LATTA. Also I see from your testimony page 8 you talk about how you are finalizing the rule covering the standby power of microwave ovens and you go on with the proposals for the lamp fixtures, commercial refrigerators, and commercial walk-in coolers and freezers. And I guess the question is are there any other appliance rules that you see that are being planned in the future?

Mr. MONIZ. Yes, indeed, and I would be happy to supply a list of those. The next one we have said—the next proposed rulemaking we hope to advance in November on electric motors.

Mr. LATTA. OK. And if you have any other appliances that you see coming up in the future if you could supply that to the committee—

Mr. MONIZ. Certainly. I would be happy to write a list.

Mr. LATTA [continuing]. We would appreciate that.

Mr. MONIZ. And I might add that in addition to the rulemaking we are, when it is appropriate—for example, right now with set-top boxes, we are pursuing voluntary discussions because, frankly, when the industry and consumers can come together and agree on a rule that we think is good, that will actually get the rule implemented faster. So we work both on the rulemaking and on convening voluntary approaches to efficiency standards.

Mr. LATTA. Thank you, Mr. Chairman. My time is expired and I yield back.

Mr. WHITFIELD. At this time I recognize the gentleman from Texas, Mr. Olson, for 5 minutes.

Mr. OLSON. Thank you, Mr. Chairman, for holding today's hearing.

And like you and Chairman Emeritus Barton and many colleagues on my side of the aisle, I am disappointed that so many of the Administration's experts that are working to justify and put out new carbon rules decided not to educate the public by testifying here this morning. The 2 out of 13 attendance ratio does not bode

well for the most open, transparent Administration ever. But I am sure we will find out where these people are, these people tomorrow that do their jobs after we leave here.

But we do have the few and the proud. Secretary Moniz, Administrator McCarthy, welcome. My question will focus on refineries, the U.S. energy renaissance, and power grid issues in Texas. First of all, refineries: Ms. McCarthy, much of today's discussion has been about the President's carbon plan, and it has been about the power sector, but I also worry about EPA's next steps for the refineries.

Less than 1 month ago your EPA announced that the Houston area was on track to attain ground-level ozone standards by 2018. Your EPA put up "these reductions are even more impressive given Houston's rank as one of the fastest-growing metropolitan areas in the country." But rather than recognizing success, EPA is already working on more strict ozone and so-called Tier 3 rules. And we keep hearing rumors of new rules for greenhouse gases in the refining space. All this could mean billions of dollars, billions in compliance costs. These costs will hit families hard and be passed on to average drivers across the country in places like Sugar Land, Pearland, and Katy, Texas.

So briefly—I say briefly because I am limited time here—can you tell me when to expect these carbon rules for refineries, what window of time frame, ma'am?

Ms. MCCARTHY. I don't have a time frame for you.

Mr. OLSON. No time frame, OK. Will you commit to study the cumulative cost of all these rules when we consider the impacts of carbon regulations on refineries?

Ms. MCCARTHY. Well, I will certainly commit to following whatever protocols we are required to do, sir.

Mr. OLSON. In the following what I call the Chairman Emeritus Dingell rule, answering yes-or-no questions, yes or no, can you guarantee that your rules will not raise gasoline prices? Yes or no?

Ms. MCCARTHY. I don't know what rules you are referring to and I would never make guarantees to anything, sir.

Mr. OLSON. OK. All right. A further line of question, this is about the U.S. energy renaissance. As you know, Ms. McCarthy, carbon emissions from the United States have fallen in recent years without these new regulations. And there are many factors, but a significant reason is the increased use of American natural gas.

Ms. MCCARTHY. Um-hum.

Mr. OLSON. And again, the Dingell rule, yes or no, do you agree that hydraulic fracturing and horizontal drilling have created an American energy renaissance that is helping to slash carbon emissions? Yes or no?

Ms. MCCARTHY. Yes or no, it is a complicated question. I will take it very short. I believe that certainly the new technology has advanced our ability to capture natural gas domestically. That has been a wonderful thing from both air quality as well as domestically, and I think that answers your question.

Mr. OLSON. I will take that leaning yes. Yes or no, would carbon emissions be higher today if fracking were banned or regulated out of existence? Yes or no? No fracking, higher emissions?

Ms. MCCARTHY. I can't make that direct connection, sir. You are asking me really complicated questions for yes or no.

Mr. OLSON. OK. I don't think it is that complicated but the answer is pretty clear you think it is yes.

And one final question, this is for you, Secretary Moniz, as well. My home State, as you know, is in desperate need of new reliable power. At a time when we are looking at blackouts in 2014 and 2015 without more power generation, the EPA is considering carbon rules that can essentially mandate partial carbon capture and sequestration. Now, I am not opposed to CCS. As we discussed earlier in my testimony, you came here a couple months ago, my district is actually home to one of the only CCS modifications in the country, the W.A. Parish plant outside of Needville, Texas.

Mr. MONIZ. Um-hum.

Mr. OLSON. Again, another yes-or-no question. Secretary Moniz and Ms. McCarthy, do you believe that CCS technology is currently economic for most coal plants, not just the Parish plant in Needville, Texas, which is valuable because we have oil and gas right there, right on the property. They can get the carbon there quicker.

Mr. MONIZ. As we said, sir, earlier, I mean the combination of the CCS with EOR is very attractive.

If I may just have one thing, Mr. Chairman. Since this issue has come up many times about the two of us being here, I just want to say that, first of all, there has been no trouble occupying 3 hours with two of us, but secondly, I know my colleagues, our colleagues across the Administration would be delighted to have a conversation about all of these issues.

Mr. WHITFIELD. Thank you very much. The gentleman's time is expired.

I will say to you that you are right, it took up a lot of time today. We are going to get back in touch with those other agencies and either meet with them individually or through letter exchange. So we are going to follow up with them.

At this time, I would like to recognize the gentleman from Illinois, Mr. Kinzinger, for 5 minutes.

Mr. KINZINGER. Thank you, Mr. Chairman. And I thank you both for being here and for your service to your country and for the last few hours have given us.

Secretary Moniz, I have heard you speak in favor of the President's Climate Action Plan, and to that extent I understand the concerns surrounding the reduction of greenhouse gas emissions being expressed. That being said, statements from energy experts have said electrical prices are projected to have increased over 40 percent since 2001, which is well above the rate of inflation, and it will continue to rise due to the requirements of EPA clean air and environmental standards.

In addition to this, over 60 percent of our Nation's clean power generation actually comes from nuclear power, which is virtually emissions-free, and I am very concerned with the efforts of your agency in regards to the future of the nuclear energy sector. I believe that any serious plan to reduce greenhouse gas emissions must have a strong nuclear component, yet the number of nuclear plants that have announced their retirement this year has grown

to almost epidemic portions and more are expected in the near future. Let me just ask you first off, and keep it, you know, as brief as possible, what are your goals for the growth of the nuclear energy sector overall?

Mr. MONIZ. Well, first of all, I mean the closures obviously have a bunch of factors. In one case there was an equipment issue in California.

Mr. KINZINGER. Sure.

Mr. MONIZ. In Vermont it is principally—

Mr. KINZINGER. But a lot of it is age. We haven't built new plants—

Mr. MONIZ [continuing]. Natural gas—

Mr. KINZINGER [continuing]. In 20 years' time.

Mr. MONIZ. They are older.

Mr. KINZINGER. Understood.

Mr. MONIZ. But the Department of Energy, before I was there, have for years already been supporting things like life extension technologies, et cetera. So that is one direction. Another is we are still working on the provisional loan guarantee for the Vogtle plants. It is really important to get some of these new plants built.

Mr. KINZINGER. Has the DOE actually closed any of those loan guarantees?

Mr. MONIZ. Well—

Mr. KINZINGER. No.

Mr. MONIZ [continuing]. On nuclear—

Mr. KINZINGER. Why not?

Mr. MONIZ [continuing]. Just the—it is an ongoing negotiation and a—

Mr. KINZINGER. Because it has been a while, I know, so—

Mr. MONIZ. All I can say is—

Mr. KINZINGER [continuing]. I hear the discussion about it—

Mr. MONIZ. All I can say is that I have taken a direct interest in this.

Mr. KINZINGER. OK. Because I mean from our perspective I hear the Administration use, and in fact I heard you a number of times today use the loan guarantees as promise for, hey, we support it, but these are all conditional. They are not finalized. And when you have a number of plants closing because of the age of these plants and we are very slow to replace that capacity—and let me ask you this. Do you believe that the greenhouse gas targets set out by the Administration can be met without the use of nuclear power?

Mr. MONIZ. Clearly, the 17 percent goal for 2020 is what you are referring to, which we are kind of almost halfway there. Clearly, if there are a lot of nuclear power plant closures in that time, that will certainly make it more difficult.

Mr. KINZINGER. And I know this is just we are asking you to guesstimate, how many more nuclear plants do you think will be put out of commission before those targets would become unattainable?

Mr. MONIZ. On that I do not know but I can tell you that I am hoping to have discussions with the industry to try to understand better where that is going. I mean nuclear power plants that exist still do have, you know, pretty low marginal costs, which would



make them attractive, but as we know, the lower natural gas prices has lowered the clearing price in many parts of the country.

Mr. KINZINGER. Sure. Absolutely. And again, I want to make the point of what we were talking about earlier, that there are no loan guarantees in existence right now. They are conditional.

And I will just say to finish up—I won't take all my time; hold your applause, please—if the Administration was serious about addressing climate change, I think it would harness the clean energy from nuclear power, as we have been talking about. At a minimum it would follow the law. I heard a lot of discussion about following the law today. And it would reconstitute the Yucca Mountain program and provide a solid basis for the NRC to issue new plant licenses.

And so I thank you for your time today. I thank you for your testimony. And, Mr. Chairman, I will yield back.

Mr. MONIZ. Well, we are following the law.

Mr. WHITFIELD. The gentleman yields back.

At this time, you all may have noticed Ms. Schakowsky is over here, and we have sort of ignored Ms. Schakowsky. And she is a member of the Energy and Commerce Committee, but she is not a member of this subcommittee, so traditionally, we finish all the subcommittee members before we go to Ms. Schakowsky. And Mr. Griffith, Ms. Schakowsky, has said that he has noted you sitting over there patiently, so I would like to recognize you for 5 minutes if you would like to ask your questions now because he—

Ms. SCHAKOWSKY. Well, I thank you both, especially Mr. Griffith for that courtesy.

I believe that the threat to at least human life on our planet is the greatest challenge that humankind has faced. And I feel so strongly that this Congress, this Congress, is in a moment of such great opportunity where we could take leadership on behalf of the United States, on behalf of the countries around the world that we could benefit economically. This is a moment of great opportunity that I fear as a member of the Energy and Commerce Committee that we are squandering. And I look at some of the young people in this audience; this is their century, and I feel an obligation that we try and do something about this.

I would like to see if either of you have a comment about this issue of coal and this promulgated ruling that is about to come out. Some of the charges are that it would have basically an insignificant effect on climate change, and that it actually would jeopardize the economic opportunities of people in poor countries and further impoverish them. That is a pretty heavy charge. I wonder if you, Madam Administrator, could give us some answer to that—

Ms. MCCARTHY. I would be happy to begin.

Ms. SCHAKOWSKY [continuing]. And Secretary Moniz.

Ms. MCCARTHY. What I would say is that the reason why the power plant sector is one of the first places to go to regulate carbon pollution is because it is by far the largest industry sector in terms of its generation of greenhouse gases. The second reason is that there are opportunities to reduce greenhouse gases, and that will position us in the energy future. And I think there is every reason why we should want to tee up ideas and options for how to do that effectively, taking advantage of modern technologies that we can

take advantage of and escalate their introduction both in the U.S. as well as internationally. That is what is going to make significant differences, not just what we are doing here, but its impact in moving cleaner technologies forward.

The issue of the international discussion I think that you will see that the language in the President's Climate Action Plan is very detailed on this issue. It in no way steps back from both the intent of the United States and our obligation to work with the developing countries to ensure that they mature and provide energy for their citizens. And the language in here is not inconsistent with that goal. It will not minimize our efforts towards that goal. What it does say, however, is that we need to be careful about how we are investing and we don't want developing countries to make mistakes that we might have made in not positioning themselves for the best technologies available in a carbon-constrained world.

Mr. MONIZ. I would just add that the Climate Action Plan, as far as the things like the Ex-Im Bank, does have an exclusion for the least-developed countries.

Ms. SCHAKOWSKY. I see. Let me just say how much I appreciate your being here and the fact of having the EPA Administrator and the Secretary of Energy at a single hearing, I am sure we will have and I hope you will have an opportunity to hear others, but, you know, that is not an everyday occurrence and I want to thank you for that.

I also want to associate myself with Mr. Waxman's plea that has been made more than once that we have scientists come in and talk to us. And we can, you know, have the kind of forum where the science could be challenged, could be questioned where if there is differing opinions, but I am wondering in the seconds I have is there really a significant difference of opinion about the science of climate change?

Mr. MONIZ. Well, again, I would argue that at the level of the broad impacts in my view there is none. I think there is again very, very simple arguments as to why this is expected.

I also observed that the pattern of effects was predicted decades ago. This is not somehow being made up. Clearly, there are specific—when you start drilling down to specific issues, it is very complicated science. So earlier, we had a discussion about the last several years have seen a slowdown of warming. And as I pointed out, this is not out of the expectations on decadal scales, but that is a case where the scientists are still having some argument over the specific driver.

Recent papers, as one example, have links essentially the El Niño/La Niña issues to that, but that is an example of something that still remains to be worked out. It does not obviate the overwhelming conclusion and the overwhelming support for what is going on in terms of global warming.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time I recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you very much, Mr. Chairman.

I did appreciate the comments about using as we move forward so that we don't impoverish the other nations and impoverish our own Nation that we use modern technologies as we move forward.

The problem that I think we have and I would say that the countering plan is is that we ought to make sure those technologies are available first before we put regulations in place that then cause us to lose an entire segment of our population's jobs and our energy production, et cetera. And that has been my concern all along.

And coming from a coal-producing region, I can tell you that the policies already, not even counting the ones that are going to come out later this week or ones that may come out in the next few months, are devastating the economy of my district. And it is quite moving when you see these people. These are hardworking men and women who are out there trying to do jobs. It is not just the coalminers. It is the jobs that are relied upon, the coalmines, and, you know, every time I turn around there is another manufacturing company that was relying on the coal industry that is going out of business or needed affordable electricity that is going out of business. There is another coalmine about every other week and I am losing a coalmine in my district. Those are people who are making about \$75,000 a year that aren't making it now.

And then probably the biggest blow that any of my communities has received, and while in fairness the two first factors they listed were the double-edged scissors of ObamaCare, they also listed the fact that the economy is so poor in the area, and it is a coal-producing part of my district. And we just lost a hospital in my district. And so now some of my constituents are going to have to drive an hour, hour-and-a-half to get to cardiac care and hospital. This is not a good thing.

And when we look at the cost-benefit analysis, we don't always look at the fact that if people don't have the ability to afford the electricity in their homes that they then have to cut back on things and they have to cut back on some important things. If you can't heat your home effectively in the wintertime—and in the mountains of Virginia, sometimes it gets pretty cold—that can affect your health. If you are having a problem with your heart and all of a sudden instead of being able to go to the local hospital because of policies enacted here in Washington, you have to drive an hour, hour-and-a-half to get to heart care, that is going to have an impact on your health. There is just no way around that.

And I think that we need to look at these things, and when we say that, oh, this is all going to be grand and all going to be great, I think we have to get the science and the breakthroughs and the technological breakthroughs out there first before we say we are going to shut down a lot of coal-powered plants because the technology is not out there for everything that needs to be done in order to make them 100 percent.

And when you look at poverty, and I noticed that the gentleman earlier referenced a German article, "How Electricity Became a Luxury Good," I don't think that the people of the United States of America consider electricity to be a luxury good, and I don't think we want to be at the point where they have a minister, in this case you, Ms. McCarthy, in equal the German environment Minister Peter Altmaier giving out tips on how you don't preheat your oven to do cooking and maybe if you lower the contrast and the brightness on your television, you can bring down your electric bill because the Germans have put themselves in a position where

people can't afford it. I don't want that for my country but it is hitting my district hard right now. And so I hope that you would take that into consideration.

And along with those things, I know that the President outlined the goal of 17 percent reduction in 2005 greenhouse gas levels by 2020, and he mentioned that also at a climate speech in June at Georgetown University, and I heard Mr. Secretary say earlier that we are about halfway there. I guess my question is is that from programs from the EPA or is that from plant shutdowns? And how much of the programs that the EPA has enacted brought down those greenhouse gases in the last 5 years? Can you quantify how much the programs have brought down?

Ms. MCCARTHY. Let me just put the goal in a little bit of perspective. I think that that goal clearly was stated in the Climate Action Plan but in no way does that Climate Action Plan say that those actions are going to add up to that 17 percent. It is a start at looking at the most economically viable opportunities——

Mr. GRIFFITH. And you know that the 17 percent——

Ms. MCCARTHY [continuing]. To grow the economy and address greenhouse gas——

Mr. GRIFFITH. And I apologize, my time is running out. The 17 percent, was that just a number that was picked out of the air or was there some scientific basis for it and can you give me that basis?

Ms. MCCARTHY. I believe that it was an international goal that was stated.

Mr. GRIFFITH. All right.

Ms. MCCARTHY. There was certainly some analytics but it was not directly associated with that plan, but it remains a goal that we would like to achieve.

Mr. GRIFFITH. I mean I understand we know we are going to try to reduce greenhouse gases, but do we know specifically how much each program will give us? And that being said, if you could get that to me later because my time is just about out.

Ms. McCarthy, I truly believe when you are here to testify, and I have told people in my district that I think you do care about the plight of folks——

Ms. MCCARTHY. I do.

Mr. GRIFFITH [continuing]. And so I would ask you to commit whether it is my district or one of the other districts in central Appalachia that has been hit so hard, if we set up a trip, would you come down and see what is happening in the district of the people and where the jobs are just disappearing and there are lots of towns with empty storefronts and——

Ms. MCCARTHY. Congressman, I will follow up——

Mr. GRIFFITH [continuing]. It looks like a ghost town?

Ms. MCCARTHY. I will follow up directly with you on that.

Mr. GRIFFITH. All right. I appreciate that very much.

And, Mr. Chairman, with that I yield back.

Mr. MONIZ. If I could just say that about half of the reductions so far have been from the shale gas revolution, purely market-driven, and another part of it has been, especially in the transportation sector, the efficiency standards holding demand down.

Mr. WHITFIELD. The gentleman's time is——

Mr. WAXMAN. Which were based on regulations, isn't that correct?

Mr. MONIZ. Correct.

Mr. WHITFIELD. At this time I would like to recognize the gentleman from New York, Mr. Engel, for 5 minutes.

Mr. ENGEL. Thank you, Mr. Chairman.

Let me say that I am applauding our committee for finally having a hearing on climate change. I want to say that it is obvious to me and to everyone else the science is undeniable and it is time for us to act. And Congress has been ducking this issue even going so far as to deny the basic science behind climate change. I have seen the devastating affects right in my area when Hurricane Sandy hit New York, New Jersey, and Connecticut, and my district suffered huge devastation. Rising seas, stronger storms, and greater flooding will only increase if we choose to do nothing.

So if Congress unwilling to act on the issue, I am very happy the President has decided to act. And though some may deny the existence of climate change, the science is clear. If people object to the specifics of the President's plan, then they should propose their own plan for curbing carbon pollution and climate change and the committee should actively pursue this matter.

We also know from experience that government can regulate pollution without hurting the economy. In fact, many of the ideas that will help reduce carbon pollution will also grow new industries in renewables, carbon capture technology, and other new technologies that will help mitigate climate change.

So, Secretary Moniz, let me ask you, you mentioned in your testimony the devastation that Sandy wrought upon New York, New Jersey, and Connecticut. One of the major issues arising from that was the loss of power and the length of time that it took to return. Can you speak to what the Department of Energy is doing in regard to electricity reliability and how that works with the President's Climate Change Plans?

Mr. MONIZ. Yes, thank you. I will mention two areas. One is in the context of our general work on kind of the electric grid of the 21st century we are folding in very heavily resilience issues, as well as the kind of renewables and other drivers of that technology. And I mentioned earlier that one specific project we just had announced in New Jersey looking at a micro-grid to support a major transportation corridor, which by the way would also be an important evacuation route for New Yorkers.

The second thing, which is very important, and we are working closely with industry with API, the American Petroleum Institute, and the EEI. What we learned in Sandy a little bit the hard way was how the electricity infrastructure and the transportation fuels infrastructures are so interdependent. So we are working on that and being positioned for any future event.

Mr. ENGEL. So implementation of these plans is ongoing? We can expect that soon?

Mr. MONIZ. Yes, it is. We hope to have a product that we will put out at the end of the month, for example.

Mr. ENGEL. Thank you. I have been a long supporter of alternative fuels for transportations. Besides electric vehicles that you

mentioned, what are other alternative fuels is the Department of Energy working on?

Mr. MONIZ. Well, we certainly support—and particularly for heavy vehicles—looking at the issue of natural gas as a transportation fuel. We of course have a very extensive program on advanced biofuels moving to cellulosic biofuels, for example. And these are again a case where costs are coming down quite dramatically, not quite there yet but coming down dramatically.

And of course electrification again costs have dropped dramatically, not yet for the long-range vehicle for the mass market but the penetration is happening much faster than it did at the comparable stage for hybrid vehicles, looking very, very interesting.

And then more to the future, the hydrogen economy and fuel cells, that remains kind of a little bit earlier in the development. But I would say alternative liquid fuels and electricity are looking actually quite interesting.

Mr. ENGEL. Thank you. I know you both have been here a long time so, Administrator McCarthy, I am going to submit a couple of questions for you and spare you from having to answer it. But I thank both of you—

Ms. MCCARTHY. Thanks.

Mr. ENGEL [continuing]. For your hard work—

Mr. WAXMAN. Would the gentleman—

Mr. ENGEL [continuing]. And—

Mr. WAXMAN. The gentleman from New York, if—

Mr. ENGEL. Yes?

Mr. WAXMAN [continuing]. You have completed your questions, I would like to just make a—

Mr. ENGEL. Certainly.

Mr. WAXMAN [continuing]. Yield to me the time?

Mr. ENGEL. Yes, sir.

Mr. WAXMAN. I just want to make a comment on the hearing, which I think has been an excellent hearing.

We are at a critical crossroads in this country in our energy policy, and if we decide to do nothing, which I sense is what the Republicans want is to do nothing, it is going to lead to more carbon pollution, more droughts and floods, and other extreme weather events, more billion-dollar disasters and relief bills to pay for them by the taxpayers. If we take that path, history will not treat us kindly. We will be the generation that ignored the warnings of scientists and left future generations a violent and inhospitable climate.

On the other hand, there is another path. We have a shrinking window for action but we still have a window to act. And Secretary Moniz told us that this is the critical, crucial time this decade. If we act now, if we invest in solar, wind, and other clean energy sources, if we unleash American ingenuity, we can stop carbon pollution and protect our atmosphere and create millions of new clean energy jobs.

I want to thank the two witnesses who have been very, very helpful and terrific in being here all this time. I hope we will all put aside our partisan differences to help achieve these goals. They are very important ones for the future of our country and the rest of the world.

Thank you, Mr. Chairman. Thank you, Mr. Engel.

Mr. WHITFIELD. Thank you, Mr. Waxman.

And I would also say how much we appreciate the two of you being here today. We do think it is a major accomplishment that our CO<sub>2</sub> emissions are lower than they have been in 20 years. And as we move forward, I think we all want a balanced approach. We want to protect the environment but we also want to make sure that we have a strong, viable economy and that we don't want to be left in a noncompetitive position in the world marketplace.

And I hope that you all look as forward to being with us in the future as we look forward to being with you again here. We spent 3 or 4 marvelous hours together. And that will——

Ms. MCCARTHY. We will be back, Mr. Chairman.

Mr. WHITFIELD [continuing]. Conclude today's hearing, but I would remind Members that they have 10 business days to submit questions for the record, and I ask that the witnesses all agree to respond promptly to the questions that we submit to you all.

So thank you again and we look forward to working with you as we move forward.

Mr. MONIZ. Chairman, thank you for holding this hearing.

Mr. WHITFIELD. Thank you.

Mr. MONIZ. We appreciate it very much.

Mr. WHITFIELD. Thank you. That concludes today's hearing.

[Whereupon, at 1:22 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2937  
Minority (202) 225-3641  
October 25, 2013

The Honorable Ernest J. Moniz  
Secretary  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585

Dear Secretary Moniz:

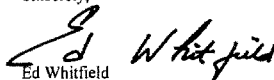
Thank you for appearing before the Subcommittee on Energy and Power on Wednesday, September 18, 2013, to testify at the hearing entitled "The Obama Administration's Climate Change Policies and Activities."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

To facilitate the printing of the hearing record, please respond to these questions by the close of business on Friday, November 8, 2013. Your responses should be e-mailed to the Legislative Clerk in Word format at [Nick.Abraham@mail.house.gov](mailto:Nick.Abraham@mail.house.gov) and mailed to Nick Abraham, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, D.C. 20515.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,

  
Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Bobby L. Rush, Ranking Member,  
Subcommittee on Energy and Power

Attachment



205



**Department of Energy**

Washington, DC 20585

December 18, 2013

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 18, 2013, Secretary Ernest Moniz testified regarding "The Obama Administration's Climate Change Policies and Activities."

Enclosed are the answers to 17 questions that were submitted by Representatives Barton, Gardner, and Dingell to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



Printed with soy ink on recycled paper

**QUESTIONS FROM REPRESENTATIVE BARTON**

- Q1. According to an Aug. 29 Bloomberg press report, certain EU Members sought to exclude from the final summary document for the upcoming IPCC assessment any reference to the global warming “hiatus” or “pause” that has occurred over the last 15 years. According to that article, U.S. regulators are also trying to make certain changes to the summary document.**
- a. What is DOE’s role with regard to the development of the IPCC assessment?**
- A1a. The Department of Energy supports a significant amount of climate research that is pertinent to the IPCC. For the IPCC Fifth Assessment Report (AR5), Working Group 1 (WG1), DOE staff, DOE Laboratory staff and academic researchers funded by DOE served in roles of Lead Authors, Contributing Authors, and Reviewer Editors. In addition, experts from DOE contributed to the U.S. Government review of the report in its draft form.**
- b. Did DOE participate with other U.S. regulators in developing comments on the summary document?**
- A1b. The Department of Energy participated in the interagency effort that developed the U.S. Government response to the AR5 WG1 report . DOE employees and DOE national laboratory scientists reviewed both the Second Order Draft and Final Government Distribution of the WG1 report that included the Summary for Policy Makers.**
- c. What changes to the summary document did DOE and U.S. regulators propose?**
- A1c. The U.S. Government provided numerous comments and suggestions to the IPCC . These comments sought to clarify and improve the accuracy of the document. All U.S. agency comments to the IPCC were coordinated and submitted by the Department of State**

**Q2. For the President's Climate Action Plan, has there been an assessment done of the costs to the government to fully implement the plan? If yes, what is the estimated cost?**

A2. The President's Climate Action plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many activities will be undertaken within existing budgetary levels, including by reprioritizing current spending. DOE has not conducted a comprehensive assessment of the costs to the government to fully implement the plan.

**Q3. For the President's Climate Action Plan, has there been an assessment done of the costs to consumers to fully implement the plan? If yes, what is the estimated cost?**

A3. The President's Climate Action plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many of the elements of the Plan are explicitly designed to save consumers money (see, for example, the section entitled "Cutting Energy Waste in Homes, Businesses, and Factories") or to reduce costs to consumers through better preparation for the inevitable impacts of climate change (see, for example, the section on "Building Stronger and Safer Communities and Infrastructure"). Where specific elements of the plan call for new standards, the costs and benefits of those standards will be analyzed and balanced through existing provisions of law requiring regulatory analysis and reasoned decision making that takes that cost-benefit analysis into account. Because the implementation of the plan involves decisions that will be taken only after notice and public comment, as well as savings and avoided costs through adaptation, it is not possible to determine a precise cost to consumers, which might well be negative.

**Q4. Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies?**

A4. Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Work in support of natural gas development can promote national energy security as well as lead to reduced emissions. Support for nuclear power – both full scale reactor work and new work on small modular reactors – can lead to energy diversification and job opportunities and also benefit the climate. Similarly, basic scientific research can grow US competitiveness, have benefits for clean energy development, and also provide other societal benefits. It is therefore not possible to determine which share of a given program is climate change related and which is not.

**Q5. Describe the climate change adaptation, mitigation or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.**

A5. Many DOE science and technology programs are related to climate change mitigation, even if climate change is not the primary focus. In addition, DOE has been engaged in a number of climate change adaptation related activities, including: conducting an assessment of climate change impacts on the energy sector; conducting an assessment of climate-change impacts on DOE's operations and identifying actions to enhance operational sustainability; supporting the development of the third U.S. National Climate Assessment; and developing actionable climate science information for projecting the impacts of climate change.

**Q6. Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which you agency currently participates or has participated since January 2005.**

A6. Since 2005, the Department of Energy has participated in several climate change interagency activities, including the Committee on Climate Change Science and Technology Integration (CCCSTI) and its subsidiary bodies; the Interagency Climate Change Adaptation Task Force; the Department of State-led delegations to the United Nations Framework Convention on Climate Change (UNFCCC) and preparatory meetings of the delegation; the State Department's Interagency Adaptation Committee; the United States Global Change Research Program (USGCRP) Working Group; the Department of Interior Climate Change Adaptation Working Group – Advisory Committee on Water Information; the Interagency Working Group on the Social Cost of Carbon; Review Committees for the IPCC 4th and 5th assessment reports; and interagency led meetings related to the development of the President's Climate Action Plan.

**Q7. Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed agency, if any, since January 2005.**

A7. Many DOE programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Similarly, basic scientific research can have benefits for clean energy development, along with other societal benefits. As such, it is not possible to determine which share of a given program is climate change related and which is not.

**Q8. Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.**

A8. Detailed regulatory notices and impact assessments are provided on the relevant DOE program webpage. However, it is impossible to separate DOE's regulatory actions into those that are related to climate change and those that are not.

**Q9. Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.**

A9. The Department of Energy coordinates a number of energy initiatives through bilateral and multilateral forums; a number of these also include climate change related work.

The Department's bilateral relationships and agreements involve a range of countries including: Argentina, Australia, Brazil, Canada, Chile, China, France, India, Indonesia, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, and the United Kingdom. Specific bilateral initiatives include the U.S.-Brazil Strategic Energy Dialogue (SED), the U.S.-China Clean Energy Research Center, the U.S.-India Partnership to Advance Clean Energy – Deployment (PACE-D), and the Turkey Near Zero Zone and Industrial Energy Efficiency Training.

The Department works on a number of longstanding multilateral processes, including:

- The Asia-Pacific Economic Cooperation (APEC), which DOE uses to coordinate on energy efficiency, renewable energy, clean fossil energy, and energy data and analysis issues for the region.

- The Clean Energy Ministerial, for which DOE serves as the Secretariat, has current initiatives that focus on transforming the global power sector, driving equipment and appliance efficiency, and transferring best practice policy solutions for clean energy.
- The Energy and Climate Partnership of the Americas (ECPA) which is working on energy efficiency, renewable energy, a more resilient and modern energy infrastructure, and energy poverty.
- G20 initiative on Fossil Fuel Subsidy Reform, which DOE, in coordination with the Department of Treasury, spearheads the initiative for G20 countries to phase out inefficient fossil fuel subsidies over the medium term.
- International Energy Agency, where DOE leads interactions on oil markets, and also participates in discussions on global energy supply and demand and technology.
- Major Economies Forum on Clean Energy and Climate, a group led by the State Department, but where DOE provides technical inputs on issues such as energy efficient buildings, renewable energy technology, carbon capture and storage.
- Carbon Sequestration Leadership Forum, an international group of large fossil fuel users working together to promote carbon capture and storage technologies.
- United Nations Framework Convention on Climate Change, where DOE participates as a member of the State Department-led delegation to negotiations.

**Q10. Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.**

A10. Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Similarly, basic

scientific research can have benefits for clean energy development, along with other societal benefits. As such, it is not possible to determine which share of a given program is climate change related and which is not.

**Q11. Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.**

- A11. The DOE Sustainability Performance Office (SPO) ensures Departmental compliance with Federal and Departmental sustainability requirements, including mandates from the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007 and Executive Orders 13514 and 13423. These activities further the Department's strategic goal of advancing the Nation's energy and economic security by ensuring that DOE increases its energy productivity and energy diversity, while reducing GHG emissions and energy use.

The SPO coordinates data collection, reporting, and analysis of departmental energy, water, and resource data and manages and implements the Department's annual Strategic Sustainability Performance Plan. Technical assistance is provided to DOE's 47 major sites throughout the U.S. in support of sustainability goal progress and achievement. SPO also supports the Department's effort to increase the use of alternative financing and performance contracting to fund many of the improvements associated with meeting the statutory efficiency goals. To date, the Department has utilized performance contracts for approximately \$512.6 million in project investment, including the largest wind farm on Federal land at the Pantex Plant in Amarillo, Texas, saving taxpayer dollars while improving the environment. Additionally, SPO provides oversight and execution of energy, water, and resource assessments. These assessments, coupled with the



implementation of cost-effective energy conservation measures and efficiency improvements, reduce the Department's operating expenses, overall energy use, and GHG emissions.

The SPO is funded from the DOE Specific Investments line item in the Federal Energy Management Program (FEMP) budget. The FY 2013 appropriations level was \$3.774M.

The Federal Energy Management Program provides access to public data illustrating the progress made by Federal agencies toward meeting greenhouse gas reduction targets required under E.O. 13514. It also collects and reports to Congress annually on the activities of Federal agencies to improve water efficiency and management.

- Q12. Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.**
- A12.** Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, the nuclear energy program is working to make nuclear energy safer and more affordable, which will also have climate change mitigation benefits. Similarly, scientific research provides a foundation for future economic growth and may also lead to breakthroughs in clean energy. As such, it is not possible to determine which program offices and employees are working on climate change related activities.

**QUESTION FROM REPRESENTATIVE GARDNER**

**1. The Energy Star program has been used by consumers for many years as a guide to purchase sensible, energy efficient products. In Administrator McCarthy's previous role as Assistant Administrator for Air, she oversaw the entire Energy Star program. Historically, industry and retailers in the Windows, Doors and Skylights sector have strongly supported the program. However, today virtually all are questioning both the process for revising product standards and, as a result, the standards themselves.**

**Manufacturers and retailers believe that, in the name of saving the most energy possible, the EPA proposed Energy Star standards can only be met by products too expensive for consumers to justify the added expense. This is especially true when the payback period is significantly longer than the average length of time a homeowner stays in their house.**

**Q1. If Manufacturers and retailers, who are closer to the consumer than energy star technicians, believe there is a problem, how can the program be successful?**

A1. ENERGY STAR is a voluntary partnership among consumers, manufacturers, and government, united in the pursuit of a common goal: to protect our environment for future generations by changing energy efficient practices today. ENERGY STAR's use of two core principles – transparency and maintaining a collaborative relationship with both industry and other stakeholders – has led to the program's success.

Consistent with these principles, when establishing new criteria, or revising existing criteria, ENERGY STAR works in close collaboration with stakeholder groups, including manufacturers, retailers, energy efficiency program sponsors and interested non-governmental organizations. Technical and economic analysis is performed and shared to ensure that the criteria are established in a manner that highlights cost-effective products available to consumers.

**Q2. Isn't it in the interest of the retailers and manufacturers to promote the most energy efficient AND economically efficient product possible?**

A2. ENERGY STAR is a voluntary partnership that includes retailers, manufacturers and government, among others. In addition to its primary energy-savings goal, the partnership also seeks to reduce greenhouse gas emissions and other pollutants caused by the inefficient use of energy, and it aims to make it easy for consumers to identify and purchase energy-efficient products. Products that have earned the ENERGY STAR designation meet strict criteria for energy efficiency set by EPA according to the test methods developed by DOE in support of the ENERGY STAR product designations (the Energy Star program for windows, skylights, and doors was previously managed by the Department of Energy, but is now managed by EPA). Participation in the ENERGY STAR program is in the interest of retailers and manufacturers, as it enables them to differentiate their products in the marketplace and benefit from an increasingly recognized and sought-after symbol. ENERGY STAR partners can join national campaigns supporting key product areas and add their products to a Qualified Products listing for consumers to consult when shopping for energy efficient products.

A guiding principle of the Energy Star program consists in establishing criteria such that consumers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time. Specifically, ENERGY STAR specifications are set so that if there is a cost differential at the time of purchase, that cost is recovered through utility bill savings within the life of the product.

Like the Department of Energy's mandatory federal Appliance and Equipment Efficiency Standards Program, the voluntary ENERGY STAR program seeks to increase the average efficiency of new purchased products. However, instead of prohibiting the manufacture and sale of products that do not meet a certain efficiency threshold, the ENERGY STAR program encourages the voluntary adoption of highly efficient products. Products that meet the ENERGY

STAR efficiency level can be labeled as ENERGY STAR qualified. This process ensures economic efficiency by providing consumers with sufficient information to consider a given product's efficiency (and the resulting operating cost savings) in their voluntary purchasing decision. These two programs are complementary in that they promote energy-efficiency improvements in appliance products over a broad range of price points.

**Q3. Energy Star products cost more than other products. So, if the President believes that everyone has a role in reducing greenhouse gases emissions, then how does it make sense to discourage consumers from purchasing Energy Star products, since they won't see that added investment paid back for a decade or more.**

A3. A guiding principle of the Energy Star program consists in establishing criteria such that consumers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time. Specifically, ENERGY STAR specifications are set so that if there is a cost differential at the time of purchase, that cost is recovered through utility bill savings within the life of the product.

**QUESTIONS FROM REPRESENTATIVE DINGELL**

**Q1. Does DOE see a future for coal as a viable energy source in light of the impending greenhouse gas regulations?**

A1. Today, coal accounts for about 20% of the total energy consumption in the United States, and fuels about 40% of our electricity generation. Coal will continue to be an important part of the Administration's all-of-the-above energy strategy. The current challenge of addressing climate concerns is not a new development for the coal industry insofar as environmental regulations have historically driven the development of new technologies to one degree or another, depending on the requirements of the particular statutory standard at issue.

DOE's research, development, and demonstration of advanced carbon capture and storage (CCS) technologies will enable CCS deployment as rapidly as possible, and allow coal to maintain its role in producing baseload electricity for America while providing the technology development push which will be essential to meeting the President's broad national energy goals. DOE will continue to tackle the technical challenges and reduce costs for advanced clean coal technologies, and to provide key information to decision makers inside and outside government about the current and future opportunities for coal as a competitive clean-energy fuel.

**Q2. What is DOE doing on potential shortages of electric power because of the actions being taken on global warming and how that will affect our future regarding the availability and reliability of electric power?**

A2. The President's Climate Action Plan, announced in June, calls for upgrading the country's electric grid because it is critical to our efforts to make electricity more reliable, save consumers money on their energy bills, and promote clean energy sources. A nine

member interagency team, known as the Rapid Response Team for Transmission (RRTT), created in 2011, aims to identify ways to improve the overall quality and timeliness of electric transmission infrastructure permitting, review, and consultation by the federal government on both federal and non-federal lands to help ensure transmission projects are not unnecessarily delayed. Under a June 7, 2013 Presidential Memorandum entitled “Transforming our Nation’s Electric Grid through Improved Siting, Permitting, and Review,” the RRTT members were charged with the development of an integrated, interagency pre-application (IIP) process for significant onshore electric transmission projects requiring Federal approval(s).

A formalized pre-application process, with DOE acting as lead coordinating agency (as authorized by Congress in 2005 through Section 216(h) of the Federal Power Act), is expected to result in improvements to efficiency and timing of Federal agency authorization(s). These improvements will, in turn, expedite the construction and provision of transmission capacity necessary to bring electricity generated through renewable and other low-carbon generation sources online as demand is expected to increase. In addition to providing new pathways to bring low-carbon energy to market in the near future, these improvements in siting transmission infrastructure will allow for improvements in grid reliability. Additionally, these improvements will support sustained flexibility in electric markets gained through longer term investments in energy efficiency and conservation efforts, demand-response and micro-grid technologies.

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115  
Majority (202) 225-2927  
Minority (202) 225-3641  
October 25, 2013

The Honorable Gina McCarthy  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Dear Administrator McCarthy:

Thank you for appearing before the Subcommittee on Energy and Power on Wednesday, September 18, 2013, to testify at the hearing entitled "The Obama Administration's Climate Change Policies and Activities."

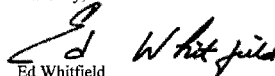
Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

Also attached are Member requests made during the hearing. The format of your responses to these requests should follow the same format as your responses to the additional questions for the record.

To facilitate the printing of the hearing record, please respond to these questions and requests by the close of business on Friday, November 8, 2013. Your responses should be e-mailed to the Legislative Clerk in Word format at [Nick.Abraham@mail.house.gov](mailto:Nick.Abraham@mail.house.gov) and mailed to Nick Abraham, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, D.C. 20515.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,

  
Ed Whitfield  
Chairman  
Subcommittee on Energy and Power

cc: The Honorable Bobby L. Rush, Ranking Member,  
Subcommittee on Energy and Power

Attachments



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

APR - 2 2014

OFFICE OF CONGRESSIONAL  
AND INTERGOVERNMENTAL RELATIONS

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, D.C. 20515

Dear Chairman Whitfield:

Thank you for your letter of October 25, 2013, to EPA Administrator Gina McCarthy requesting responses to Questions for the Record following the September 18, 2013, hearing before the Subcommittee on Energy and Power entitled, "The Obama Administration's Climate Change Policies and Activities."

The responses to the questions are provided as an enclosure to this letter. If you have any further questions please contact me, or your staff may contact Josh Lewis at [lewis.josh@epa.gov](mailto:lewis.josh@epa.gov) or (202) 564 2095.

Sincerely,

A handwritten signature in black ink, appearing to read "Nichole Distefano", is positioned above the typed name.

Nichole Distefano  
Deputy Associate Administrator  
for Congressional Affairs

Enclosure



**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

**Attachment 1 – Member Requests for the Record**

**The Honorable Ed Whitfield**

1. During the hearing, you testified that “there are four plants that are planning on and designing in CSS at levels that would beat anything that we had proposed in our earlier proposal.” Please list those four plants and for each plant provide (i) currently estimated costs of construction; (ii) the amount(s) of government funding or financial assistance received; (iii) the date on which construction of the plant began; (iv) the date by which construction is expected to be completed; and (v) the date by which each plant is expected to be operational. In addition, please identify the source of EPA’s cost and scheduling information relating to these facilities.
- A. CCS projects under construction and/ or in advanced stages of project development that are designed to emit at levels lower than the standard are:
- Kemper County Energy Facility, Mississippi
  - Boundary Dam, Saskatchewan
  - Texas Clean Energy Project
  - Hydrogen Energy California

Additional details are provided in the proposed rule (79 FR 1429):  
<https://federalregister.gov/a/2013-28668>

**The Honorable Joe Pitts**

1. During the hearing, you testified that EPA keeps “close track” of whether climate change-related programs are accomplishing what they were pre-determined to accomplish, and that the Agency makes this information available to the public. Please identify where that information is available and accessible by the public.
- A. The EPA collects information on greenhouse gases (GHGs) through its annual *U.S. Greenhouse Gas Inventory of Emissions and Sinks*, which tracks total annual U.S. emissions and removals by source, economic sector, and GHG going back to 1990. The EPA also collects and publishes emissions data from individual facilities in the United States that emit GHGs in large quantities through the Greenhouse Reporting Program. The EPA publishes progress of our voluntary partnerships through publications such as the *Annual Report of Energy Star and Other Climate Protection Partnerships*. Finally, the EPA tracks the successful implementation of regulatory initiatives (e.g., EPA’s vehicle GHG rules) aimed at reducing GHGs using key programmatic metrics such as fuel efficiency and fuel economy standards. More information on these programs and initiatives can be found here: <http://www.epa.gov/climatechange/EPAactivities.html>.

Separately, the EPA works with many other federal agencies and organizations to better understand and communicate the causes and effects of climate change. For example, with help from these primarily federal partners, the EPA has compiled a set of indicators for tracking signs of climate change. This set of climate change indicators focuses on the United States, but some

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

include global trends to provide context or a basis for comparison. Although these indicators are not intended for determining the effect or response of any one program or action to address climate change, they are used to document climate change and its impacts, particularly in the United States. The indicators are based on peer-reviewed data from various government agencies, academic institutions, and other organizations. The EPA selected these indicators based on the quality of the data and other criteria. The EPA publishes the indicators in a comprehensive, publically available report and on the agency's web site:  
<http://www.epa.gov/climatechange/science/indicators/>.

**Attachment 2—Additional Questions for the Record**

**The Honorable Ed Whitfield**

1. **Recently 17 Attorneys General and a senior environmental regulator sent a white paper to you raising concerns that in developing New Source Performance Standards (NSPS) standards or guidelines applicable to existing fossil fuel-fired power plants that EPA will not properly defer to states in establishing and implementing standards, and will require existing power plants to operate less or shut down.**
  - a. **What assurances can you provide that in developing the agency's upcoming greenhouse gas regulations affecting existing fossil fuel-fired plants that the EPA will not force existing coal plants to operate less or shut down?**
    - A. The EPA will promulgate emission guidelines according to provisions set forth in CAA 111(d). States will then prepare plans and will ultimately be responsible for implementing programs to comply with the emission guidelines. The EPA has initiated and participated in numerous listening sessions and meetings with state representatives and other stakeholders to collect information on proposal development and to solicit suggestions on how the EPA can structure emission guidelines to provide states with the maximum available flexibility to implement the guidelines in ways that make the most sense to them. The EPA intends to develop guidelines that recognize and accommodate existing state programs and the type of measures they have traditionally relied on to reduce carbon emissions from the power sector without affecting the reliability of the grid or mandating the curtailment or shutdown of coal generation not otherwise projected to occur.
2. **According to an Aug. 29 Bloomberg press report, certain EU Members sought to exclude from the final summary document for the upcoming IPCC assessment any reference to the global warming "hiatus" that has occurred over the past 15 years. According to that article, U.S. regulators are also trying to make certain changes to the summary documents.**
  - a. **What is EPA's role with regard to the development of the IPCC assessment?**
    - A. The EPA was involved only in a review capacity for the IPCC Fifth Assessment Report (AR5). Individual EPA scientists reviewed and commented on the first order draft of AR5.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

The agency provided input for the second order draft and the Summary for Policymakers as part of the U.S. government review.

**b. Did the EPA participate with other U.S. regulators in developing comments on the summary document?**

- A. The EPA participated in the interagency effort that developed the U.S. government response to the AR5 Summary for Policymakers. EPA staff also reviewed the second order draft and final government distribution of the Working Group I report that included the Summary for Policymakers.

**c. What changes to the summary document did EPA and U.S. regulators propose?**

- A. The U.S. government provided numerous comments and suggestions to the IPCC through the Department of State concerning the Summary for Policymakers. These comments sought to clarify and improve the accuracy of the document. After the full IPCC AR5 report is finalized in 2014, all drafts submitted for formal review, the review comments, and the responses to comments by the authors, will be made available on the IPCC and Working Group websites along with the final report. Even though EPA staff were not part of the U.S. delegation during the final IPCC plenary session to approve the Working Group I Summary for Policymakers, it is our understanding that the U.S. delegation requested explicit information to address recent temperature trends, the so-called “hiatus.”

**3. For the President’s Climate Action Plan, has there been an assessment done of the costs to the government to fully implement the plan? If yes, what is the estimated cost?**

- A. The President’s Climate Action plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many activities will be undertaken within existing budgetary levels, including by reprioritizing current spending. The EPA is not aware of a comprehensive assessment of the costs to the government to fully implement the plan.

**4. For the President’s Climate Action Plan, has there been an assessment done of the costs to consumers to fully implement the plan? If yes, what is the estimated cost?**

- A. The President’s Climate Action Plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many of the elements of the Plan are explicitly designed to save consumers money (see, for example, the section entitled “Cutting Energy Waste in Homes, Businesses, and Factories”) or to reduce costs to consumers through better preparation for the impacts of climate change (see, for example, the section on “Building Stronger and Safer Communities and Infrastructure”). Where specific elements of the plan call for new standards, the costs and benefits of those standards will be analyzed and balanced through existing provisions of law requiring regulatory analysis and reasoned decision making that takes that cost-benefit analysis into account.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

**5. With regard to potential regulation of GHG emissions from aircraft:**

**a. Which U.S. agencies are involved in international negotiations relating to greenhouse gas emissions from aircraft?**

A. The international negotiations on greenhouse gas emissions and climate change from international aviation take place at the International Civil Aviation Organization (ICAO) and are focused on a comprehensive approach to reducing greenhouse gas emissions from aviation. The Federal Aviation Administration (FAA), Department of Transportation (DOT), Department of State and the EPA are involved in these discussions. Lead agencies in direct ICAO negotiations are FAA, DOT and Department of State.

**b. What is the current status of international negotiations relating to greenhouse gas emissions from aircraft? What is the schedule for conclusion of those negotiations?**

A. The recent ICAO Assembly produced an Assembly resolution that set forth a comprehensive approach to reducing greenhouse gas emissions from aviation, including the development of technology, improvement of aircraft operations, development and deployment of alternative fuels, and the development of a global market-based measure for aviation for decision in 2016.

**c. What is the current status of EPA's planned rulemaking to address GHG emissions from aircraft, and what is the agency's current schedule for that rulemaking?**

A. In response to a petition and resulting litigation, the EPA is currently initiating an analysis of whether greenhouse gas emissions from aircraft cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. When this analysis is complete, the EPA expects to propose findings regarding this question. The EPA previously estimated that, upon receipt of a court ruling on the merits of its prior greenhouse gas findings regarding motor vehicles in December 2012, a minimum of 22 months would be needed to conduct the analysis, develop a proposal, publish it for comment, review and analyze comments and issue final findings regarding aircraft engine greenhouse gas emissions. A more specific time table for rulemaking can be provided after such a determination is made.

**d. What is the range of potential costs to U.S. consumers for any international or domestic GHG emissions standards from aircraft?**

A. At this point, in advance of either an endangerment and contribution determination regarding aircraft greenhouse gas emissions or development and consideration of possible regulatory responses to such a determination, if made, it is not possible to assess potential costs of either international or domestic standards.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

**The Honorable Joe Barton**

**1. Describe the climate change related research and technology or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies.**

- A. EPA's research related to climate change is focused on ensuring that the agency is able to meet its legislative requirements to protect human health and the environment.

The EPA is investigating the impacts of a changing climate on air quality, including expected increases in ambient ozone and possible increases in ambient particulate matter concentrations. The EPA is developing air quality models that use the results of climate models developed and operated by other federal agencies (Department of Energy, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration) and "downscaling" those results to time periods and distances relevant to state- and local-scale decision makers. The EPA does not develop or operate global climate models (often known as general circulation models, or GCMs), but focuses on development and use of regional air quality models (e.g., the Community Multi-scale Air Quality model, or CMAQ) that simulate detailed atmospheric chemistry and dispersion. The EPA is also conducting research, including uncertainty and sensitivity analyses, to understand how changes in climate may alter atmospheric conditions, and therefore affect how pollutants are formed and transported in the ambient environment.

EPA's research is also designed to improve our preparedness to protect public and ecosystem health from the impacts of extreme weather events (such as heat waves, severe storms, extreme drought, and floods). These impacts directly affect components of environmental quality that are relevant to EPA's responsibilities, including water quality, air quality, environmental release of hazardous materials, and the consequent impacts to public health. The EPA is also developing tools to guide local decision makers, including the Stormwater Calculator, which is being upgraded to incorporate the impacts of climate change on expected stormwater levels, and the GLIMPSE model, which helps inform air quality managers about effective management strategies that address air quality and climate in a combined way to achieve the greatest benefits. The EPA is also evaluating the potential for other adverse impacts to human health related to climate change, for example heat stress, expanded ranges of pathogens and disease, and potentially increased levels of allergens.

In addition to the impacts of extreme weather events, the EPA is also evaluating how gradual changes in average temperature can adversely impact environmental quality for which the EPA has responsibility, including how increasing air temperatures impact rivers and oceans that support economically important species, such as salmon.

The EPA is conducting research to evaluate and develop more cost-effective methods to accurately measure greenhouse gases emissions, including methane, from fugitive and area sources to provide better means for industries to reduce emissions and improve efficiency.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

EPA's climate-related research program is also examining how advances in energy production and use technologies might influence emissions of air pollutants. Use of scenarios of energy technology development provides insight into the potential environmental impacts of such development to enable policy makers to better anticipate the potential costs and benefits of different energy futures.

These efforts, plus other research planning activities, are coordinated with those of other Federal agencies through the US Global Change Research Program.

The EPA is also working with several other federal agencies to reduce emissions of black carbon, a potent climate-forcing pollutant, from use of home stoves for cooking and heating. As noted in the 2012 Report to Congress on Black Carbon, reducing these emissions through collaborations with the Departments of State and Energy represents one of the most cost-effective means of reducing climate forcing internationally and, at the same time, improving public health, especially for women and children.

**2. Describe the climate change adaptation, mitigation, or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.**

A number of EPA programs are related to climate change mitigation, including our public-private partnership programs (e.g., ENERGY STAR, Natural Gas STAR, Landfill Methane Outreach Program, Combined Heat and Power Partnership, Green Chill, Smart Way, etc). Through the U.S.-China Climate Change Working Group, we work with the State Department and the Department of Transportation on bilateral cooperation with China on heavy duty and other vehicles and greenhouse gas management and monitoring. In addition, the EPA has been engaged in a number of climate change adaptation related activities, including: developing draft adaptation implementation plans for agency programs and regions (currently out for public comment<sup>1</sup>); supporting a grant to provide training to Native American tribes on the climate adaptation planning process; developing actionable science information; and, communicating climate change to the public through a variety of mechanisms (e.g., EPA's Climate Change Website and the Climate Change Indicators Report). Additional interagency work includes research with the Army to implement their NetZero Initiative that will increase the energy and cost efficiency of water treatment at Ft. Riley.

**3. Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which your agency currently participates or has participated since January 2005.**

- A. Since 2005, the EPA has participated in several climate change interagency activities, including the Committee on Climate Change Science and Technology Integration (CCCSTI) and its subsidiary bodies; the Interagency Climate Change Adaptation Task Force; the Department of State-led delegations and preparatory meetings to the United Nations Framework Convention on

<sup>1</sup> See <http://www.epa.gov/climatechange/impacts-adaptation/fed-programs/EPA-impl-plans.html>

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

Climate Change (UNFCCC); the Department of State-led U.S. government process to develop the national reports required under the UNFCCC which includes the quadrennial Climate Action Report and the Biennial Report; the U.S. Global Change Research Program (USGCRP) and several associated Working Groups; the Department of State's U.S.-China Climate Change Working Group; the Department of Interior Climate Change Adaptation Working Group – Advisory Committee on Water Information; the Interagency Working Group on the Social Cost of Carbon; Review Committees for the IPCC 4th and 5th Assessment Reports; interagency discussions to improve data on land-use, land-use change, and forestry and reduce methane emissions; the Interagency Task Force on Carbon Capture and Storage (led by DOE and EPA); and interagency discussions to inform development of the President's Climate Action Plan.

**4. Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistants distributed by your agency, if any, since January 2005**

- A. In the FY 2013 Final Enacted Budget, the EPA climate change related funding amounted to \$153.9M. The EPA annually submits this information to the Appropriation Committees. Please see the attached chart for funding levels from FY 2005 through the FY 2014 President's Request.

**5. Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issues, or proposed by your agency since January 2005, and/or under development by your agency.**

- A.
- Final Rulemaking: Model Year 2012-2016 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards – Published May 7, 2010
  - Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (Tailoring Rule) – Published June 3, 2010
  - Final Rulemaking: Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Published September 15, 2011
  - Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule Step 3 and GHG Plantwide Applicability Limits (Tailoring Step 3) – Published July 12, 2012
  - PSD and Title V Permitting Guidance for Greenhouse Gases – Originally released November 2010; Updated March 2011
  - Interim Permitting Guidance for GHG Emissions from Bioenergy Production – March 2011
  - GHG permitting Questions and Answers – series of Q&A's available online at <http://www.epa.gov/nsr/ghgpermitting.html>
  - GHG Control Measures White Papers – series of technical “white papers” for specific industrial sectors available online at <http://www.epa.gov/nsr/ghgpermitting.html>
  - Deferral for CO2 emissions from Bioenergy and Other Biogenic Sources under the Prevention of Significant Deterioration (PSD) and Title V Programs – July 20, 2011 (Rule vacated by the D.C. Circuit on July 12, 2013 decision – mandate yet to issue)

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

- EPA/NHTSA Final Rulemaking to Establish 2017 and Later Model Years Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards – Published October 15, 2012
  - On January 8, 2014, the EPA issued a new proposal for carbon pollution from new power plants (79 FR 1429).
  - The EPA is currently developing guidelines for existing power plants.
- 6. Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.**
- A. Since the 1990s, the EPA has participated in a number of international forums addressing climate change. These include participation in State Department-led delegations to the United Nations Framework Convention on Climate Change; as contributors and reviewers to the IPCC assessment, and special reports; Climate and Clean Air Coalition initiative leads; Interagency Working Group on the Social Cost of Carbon; Organization of Economic Co-operation and Development's Climate Change Working Group; the U.S.-China Climate Change Working Group; Global Methane Initiative; Montreal Protocol negotiations with the Department of State; meetings supporting the President's Climate Action Plan; and the U.S. Global Change Research Program.
- 7. Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.**
- A. The FY 2012 Enacted budget was \$168.4M. The EPA submits this information annually to the Hill. Please see the attached chart for funding levels from FY 2005 through the FY 2014 President's Request.
- 8. Describe the actions your agency has undertaken to respond to Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.**
- A. EO 13514 touched on many energy conservation, green building, and environmental performance measures and programs that were already required under previous executive orders (i.e., EO 13423) and previous legislation (i.e., Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007). In some cases, EO 13514 applied existing annual reduction goals beyond fiscal years covered under previous EOs and legislation, FY 2016-FY 2020; these extensions did not have a material impact on spending. Thus, EO 13514 represented a limited increase in energy conservation and sustainable facility spending, specifically in the area of GHG inventory development and Strategic Sustainable Performance Plan development.



**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

New requirements under EO 13514:

- o Set targets on GHG Scope 1 and 2 emissions for FY 2020
- o Set targets on GHG Scope 3 emissions for FY 2020
- o Develop a FY 2008 GHG emissions baseline, including business travel, commuter travel and leased space (optional)
- o Develop, maintain and report an inventory of annual GHG Scope 1, 2 and 3 emissions, including business travel, commuter travel, leased space (optional), and supply chain emissions
- o Develop and update EPA's Annual Strategic Sustainable Performance Plan

The EPA augmented its environmental stewardship program work after the issuance of EO 13514 in the specific areas referenced above. The agency had to develop baseline GHG emissions estimates and examine various scenarios to evaluate and set FY 2020 GHG emissions targets, for both Scope 1 and 2, and certain Scope 3 emissions. Augmentation of Scope 1 and 2 GHG emissions work included additional data collection and review of green power purchases. New scope 3 GHG emissions work included business air and ground travel, employee commuting, leased space (optional reporting category), and supply chain emissions (optional reporting category). Executive Order 13514 also required the development of the EPA's first Strategic Sustainable Performance Plan, as well as updating that plan annually for submission to the CEQ and OMB. This work was done through existing personnel or via an increase in technical support spending. We estimate that about \$475K was spent during Fiscal Years 2010-2013 in technical support contracts.

There has been no increase in EPA personnel spending as a result of EO 13514. Acquisition has shown a \$240K cost annually, whereas electronics has not shown any cost annually for EO 13514 efforts.

- 9. Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.**
- A. Many activities at the EPA are impacted and related to climate change, even if climate change is not the primary focus of the activity. As such, it is not possible to determine all of the program offices and quantify the number of employees are working on climate change related activities. The EPA's Office of Air and Radiation is responsible in large part for EPA's regulatory activity on climate change. Other offices directly and indirectly have activities related to climate change such as the Office of Water.

**The Honorable David B. McKinley**

**Administrator McCarthy, during the September 18, 2013 hearing on the Obama Administration's Climate Change Policies and Activities before the House Committee on Energy and Commerce, an**

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

analysis of the minimal impacts of unrealistic draconian reductions in U.S. greenhouse gas emissions was mentioned. The analysis was conducted using the Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC) that uses the United Nations Intergovernmental Panel on Climate Change (UNIPCC) Fourth Assessment Report (AR4) model results and UNIPCC emission assumptions.

However, we need to understand how your agency has used MAGICC and what the model projects under a range of different scenarios.

Please provide answer to the following:

1. A description of the version of MAGICC in current use by the EPA, including the emissions module, the temperature module and the sea level rise module.
2. A description of the climate model run library, including the specific models from the Coupled Model Intercomparison Project (CMIP3) archive.
3. The observational data used by EPA to validate MAGICC prior to its use for policy, including the results of the model runs.
4. The name(s) of the individuals responsible for validating the model under EPA's Information Quality Act guidelines.
5. The results (both graphic and table data) of all MAGICC model runs used in any policy activities since January 20, 2009 including:
  - a. U.S and global CO<sub>2</sub> emissions (with and without policy change);
  - b. Global-mean surface air temperature projection (with and without policy change);
  - c. Sea level rise projection (with and without policy change); and
  - d. A list of all input settings for each run
6. A description of the use of MAGICC in the two recent Social Cost of Carbon reports (2010, 2013).

Additionally we would also like to understand what MAGICC projects under the following scenarios:

7. Results (both graphic and table data) for a base case using Energy Information Administration (EIA) 2013 and International Energy Outlook (IEO) 2013 reference forecast emissions through 2040 and Business as Usual emissions beyond 2040 for the following Climate Sensitivities (CS):

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

- a. 3.0
  - b. 1.5
  - c. 1.0
  - d. 0.5
8. Results for the Case 7.a. CS above assuming ALL CO<sub>2</sub> energy emissions, including coal, natural gas and oil combustion emissions, go to zero in 2014
9. Results for the Annual Energy Outlook 2013 GHG25 (assumes a fee on CO<sub>2</sub> emissions that starts at \$25 per metric ton in 2014 and increases by 5 percent per year through 2040) restricted coal side case emissions use the Case 7.a. CS.

**MAGICC versus Integrated Assessment Models (IAM):**

10. Please provide the detailed comparison between each of the Integrated Assessment Models (DICE, FUND, PAGE) used in the 2013 Social Cost of Carbon Technical Source Document and EPA's reference MAGICC case for:
- a. Global-mean surface air temperature projections,
  - b. Sea level rise projections,
  - c. U.S. CO<sub>2</sub> emissions, and
  - d. Global CO<sub>2</sub> emissions through year 2100
11. Identify the individual(s) responsible for validating the IAM models used by EPA under EPA's Information Quality Act guidelines.
- A. MAGICC (Model for the Assessment of Greenhouse-gas Induced Climate Change) is a publicly available computer model that emulates larger more complex climate models in order to calculate future global concentrations, temperatures, and sea level rise, given an input emissions scenario. MAGICC has been a central tool of the climate change science community since the early 1990s. It is well designed for policy and uncertainty analysis because as an energy-balance model it is computationally efficient, can be used to simulate multiple climate sensitivities, and can be used to examine the climate impacts of marginal changes in emissions.

The EPA used MAGICC version 5.3v2 for the preparation of the Vehicle Greenhouse Gas Emissions and Corporate Fuel Economy Standards for 2012-2016 Light Duty Vehicles, 2017 and later Light Duty Vehicles, and Heavy-Duty Vehicles. Global emissions input for the model were

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

provided by the Pacific Northwest National Laboratory's Global Change Assessment Model (GCAM). The MAGICC model was used to calculate carbon dioxide (CO<sub>2</sub>) concentrations, surface temperatures, and sea level rise for the reference emissions case and for a policy case using emissions reductions associated with the rule. A sensitivity analysis was performed using multiple climate sensitivities. These results were presented in the RIAs for these rules as a complement to the monetized value provided by the Social Cost of Carbon (SCC), but were not used directly in standard setting.

MAGICC use for the SCC was limited. The SCC uses four emissions scenarios. One of the four emissions scenarios (the Integrated Model to Assess the Global Environment, or IMAGE, scenario) did not include its own carbon dioxide concentration pathway. MAGICC was used to calculate future CO<sub>2</sub> concentrations for this one scenario.

In using the MAGICC model, the agency acted consistently with its *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency*. The MAGICC model has been used by the US Climate Change Science Program (2007), the Intergovernmental Panel on Climate Change (Second, Third, and Fourth Assessment Reports in 1995, 2001, and 2007, respectively), and the National Research Council (2003). The USGCRP, IPCC, and NRC processes for preparation and review of their reports demonstrate a formal and sustained commitment to transparency and rigor in report development, review, acceptance, and approval. These assessment reports represent the best available science and supporting studies conducted in accordance with sound and objective scientific practices, are peer reviewed, and adhere to standards of quality based on objectivity, utility, and integrity. Further, many peer-reviewed publications over the past two decades have compared MAGICC to more complex models as well as observations. The EPA acted in a manner consistent with its information quality guidelines by: 1) using a model that had been extensively applied in scientific, peer-reviewed climate change science and impacts studies, 2) ensuring that the model possesses sufficient methodological documentation in peer-reviewed model validation publications, 3) confirming that the model has been independently verified and validated, and 4) ensuring that the model is sufficiently flexible and capable of evaluating important sources of uncertainty for climate analysis.

**The Honorable Cory Gardner**

**The Energy Star program has been used by consumers for many years as a guideline to purchase sensible, energy efficient products. In your previous role as Assistant Administrator for Air, you oversaw the entire Energy Star program. Historically, industry and retailers in the Windows, Doors, and Skylights sector have strongly supported the program. However, today virtually all are questioning both the process for revising product standards and, as a result, the standards themselves.**

**Manufacturers and retailers believe that, in the name of saving the most energy possible, the EPA proposed Energy Star standards can only be met by products too expensive for consumers to justify**

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

the added expense. This is especially true when the payback period is significantly longer than the average length of time a homeowner stays in their house.

1. **If manufacturers and retailers, who are closer to the consumer than Energy Star technicians, believe there is a problem, how can the program be successful?**
2. **Isn't it in the interest of the retailers and manufacturers to promote the most efficient AND economically efficient product possible?**
3. **Energy Star products cost more than other products. So, if the President believes that everyone has a role in reducing greenhouse gas emissions, then how does it make sense to discourage consumers from purchasing Energy Star products, since they won't see that added investment paid back for a decade or more?**

A. The ENERGY STAR windows, doors, and skylights program has been tremendously successful. Currently, about 80% of the residential windows sold in the U.S. earn the ENERGY STAR label.<sup>2</sup> Given the advances that this success reflects, the EPA believes it is time to update the ENERGY STAR requirements for windows, doors and skylights so the label continues to serve its important role, making it easy for consumers to identify the best performing models in the market.

Over the past three years, the EPA has led an open and transparent process, including multiple opportunities for formal stakeholder comment, to establish new requirements that are reflective of top performance in today's market. Throughout the revision process, the EPA received input and responded to comments from more than 80 different stakeholders, representing a variety of views related to the proposed new requirements. These include product manufacturers, component manufacturers, trade associations, utility programs, and other interested parties. Comments ranged from supportive of EPA's proposed criteria, to requests to make the requirements even more stringent than the EPA had proposed, to concerns that EPA's proposed requirements were too stringent.

The EPA's analysis of the proprietary cost data submitted voluntarily by product manufacturers to help guide the specification revision process indicates that the new proposed levels offer the shortest payback period for consumer (typically 7 - 10 years or less in most markets for lower and average costs products). Further, EPA's review of the current windows marketplace indicates that many proven, cost-effective technologies are readily available to help manufacturers meet the proposed specification (such as better glass or frames) and that more expensive technologies are not necessary to comply.

---

<sup>2</sup> Ducker Worldwide LLC, ENERGY STAR Window & Door Tracking Program, 2013, Page 4.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

Based on technical data provided by stakeholders during the comment process, the EPA made a number of important adjustments to the program requirements since the initial documents were first issued in 2010. And in January of this year, the agency issued the final requirements.<sup>3</sup>

**The Honorable H. Morgan Griffith**

1. **EPA issued a rule to defer regulation of CO<sub>2</sub> emissions from biomass because it recognized that biogenic carbon wasn't considered in the endangerment finding and it might need different treatment to reflect the natural carbon cycle of biomass. In July, the DC Circuit Court overturned the rule that deferred regulation of CO<sub>2</sub> emissions from biomass combustion under the air permitting program, although the Court's mandate has not been formally issued. When does the EPA plan to issue the Accounting Framework it has been working on for two years? And when will EPA revise the current Tailoring rule to permanently address the treatment of biogenic emissions in the air permitting program?**
- A. As a point of clarification, the EPA did not defer regulation of CO<sub>2</sub> emissions from biomass "because it recognized that biogenic carbon wasn't considered in the endangerment finding", as the question suggests. Instead, the EPA stated in the Endangerment Rulemaking that biogenic CO<sub>2</sub>, like all forms of CO<sub>2</sub>, was included in the air pollution that the EPA determined was reasonably anticipated to endanger public health and welfare.

The EPA issued the deferral rule in order to provide the agency time to conduct a detailed examination of the science and technical issues associated with biogenic CO<sub>2</sub> emissions from stationary sources so that we can better address the treatment of biogenic CO<sub>2</sub> emissions in EPA programs. The EPA is working on revisions to EPA's 2011 *Accounting Framework for Biogenic CO<sub>2</sub> Emissions from Stationary Source* (Framework) in light of the Science Advisory Board's September 28, 2012 Peer Review. As detailed in the President's Climate Action Plan, part of the strategy to address climate change will include fostering expansion of renewable resources and responsible forest management. A scientifically sound approach to considering biogenic CO<sub>2</sub> emissions in the air permitting program is a priority for the EPA. While the technical and methodological considerations are complex, the agency is continuing to explore an approach that is based on a variety of factors. The D.C. Circuit decision does not prevent the EPA from progressing towards assessing approaches for addressing biogenic CO<sub>2</sub> emissions under the PSD and title V programs. The EPA was already working towards such activities.

2. **Does EPA need any additional statutory authority to retain the internationally accepted principle of carbon neutrality for biomass?**
- A. The EPA is not aware of any internationally accepted principle of carbon neutrality that is embodied in the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. The IPCC has stated that: "The IPCC Guidelines do not automatically consider biomass used for energy as "carbon neutral," even if the biomass is thought to be produced sustainably."<sup>4</sup> In its Peer Review of EPA's 2011 draft Accounting

<sup>3</sup> For more information, please see [http://www.energystar.gov/index.cfm?c=revisions.residential\\_windows\\_spec](http://www.energystar.gov/index.cfm?c=revisions.residential_windows_spec)

<sup>4</sup> From the IPCC National Task Force on Greenhouse Gas Inventories, at <http://www.ipcc-nggip.iges.or.jp/faq/faq.html>.

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

Framework, the Science Advisory Board agreed further that carbon neutrality for biomass could not be assumed. Specifically, the Panel explained that, “Carbon neutrality cannot be assumed for all biomass energy *a priori*. There are circumstances in which biomass is grown, harvested and combusted in a carbon neutral fashion but carbon neutrality is not an appropriate *a priori* assumption; it is a conclusion that should be reached only after considering a particular feedstock’s production and consumption cycle.” EPA’s focus in revising the Framework is to closely consider that feedback to develop a scientifically sound approach to considering biogenic CO<sub>2</sub> emissions in the air permitting program.

3. **If EPA has determined that CCS is the best system of emission reductions, then shouldn’t CCS apply to all power generation, regardless of fuel type?**
  - A. EPA concluded that we lacked sufficient information on the application of CCS to new natural gas-fired combustion turbines to make a determination that full or partial CCS is the best system of emission reduction (BSER) for natural gas-fired combustion turbines.
4. **In his first year in office, the President outlined a goal of 17 percent reduction in 2005 greenhouse gas levels by 2020. He mentioned this same goal in his climate speech in June at Georgetown University. I assume he picked that number—17 percent—because he believes it’s achievable and economical. Can you provide a total of greenhouse gas reduction benefit of EPA’s programs and policies over the last 5 years? If that number is unavailable, wouldn’t you agree that we can’t possibly set policies that set a target number for 7 years from now if we don’t know where we are today?**
  - A. The EPA’s FY 2014 Annual Performance Plan and President’s Budget provides a blueprint for accomplishing EPA priorities. Figure 1 is a snapshot of a table from the agency’s Performance Plan and President’s Budget that identifies the EPA’s GHG reduction targets and performance measures for the agency’s climate change programs and policies. This table can be found on pages 881-882 of that document.

Figure 1: EPA’s Strategic Goals and Performance Measures to Address Climate Change

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

**PERFORMANCE: STRATEGIC GOALS 1-5 EIGHT-YEAR ARRAY**

(Boxes shaded gray indicate that a measure has been terminated for FY 2013 and beyond, therefore, data are no longer collected.)

**Goal 1: Taking Action on Climate Change and Improving Air Quality**

Reduce greenhouse gas emissions and develop adaptation strategies to address climate change, and protect and improve air quality

**Objective 1 - Address Climate Change:** Reduce the threats posed by climate change by reducing greenhouse gas emissions and taking actions that help communities and ecosystems become more resilient to the effects of climate change

Program Area	Performance Measures and Data								
(1) Address Climate Change	<b>Strategic Measure:</b> By 2015, additional programs from across EPA will promote practices to help Americans save energy and conserve resources, leading to expected greenhouse gas emissions reductions of 740.1 MMTCO <sub>2</sub> e. From a baseline without adoption of efficient practices. This reduction compares to 500.4 MMTCO <sub>2</sub> e. Reduced in 2008. (Baseline FY 2008: ENERGY STAR 140.8 MMTCO <sub>2</sub> e, Industrial Programs 1 314.2 MMTCO <sub>2</sub> e, SmartWay Transportation Partnership 5.9 MMTCO <sub>2</sub> e, Pollution Prevention Programs 6.5 MMTCO <sub>2</sub> e, Sustainable Materials Management Programs 2 34.3 MMTCO <sub>2</sub> e, WaterSense Program 0.4 MMTCO <sub>2</sub> e, Executive Order 135143 GHG Reduction Program 0.0 MMTCO <sub>2</sub> e.) <b>(PM G02) Million metric tons of carbon equivalent (MMTCO<sub>2</sub>e) of greenhouse gas reductions in the buildings sector.</b>								
	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Unit
	Target	107.8	118.8	130.2	143.0	156.9	168.7	182.6	196.2
	Actual	132.4	140.8	143.4	163.5	189.0	Data Avail 12/2013		MMTCO <sub>2</sub> e
	<b>Additional Information:</b> The baseline in 2004 is 89.5 million metric tons of carbon dioxide equivalent reductions. To serve as a basis for comparison in future years, EPA used the 2004 baseline to project into the future assuming no impact on greenhouse gas emissions from U.S. climate change programs. The baseline was developed as part of an interagency evaluation of the U.S. climate change program in 2002, which built on similar baseline forecasts developed in 1993 and 1997 in the U.S. Climate Change Action Report (2002). Baseline data for carbon emissions related to energy use is based on data from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO <sub>2</sub> ) emissions, including nitrous oxide and other high global warming potential gases are maintained by EPA.								
	<b>(PM G06) Million metric tons of carbon equivalent (MMTCO<sub>2</sub>e) of greenhouse gas reductions in the transportation sector.</b>								
	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Unit
	Target	2.2	3.3	5.5	15.4	23.7	28.0	33.0	37.0
	Actual	2.2	4.2	5.8	16.5	23.6	Data Avail 12/2013		MMTCO <sub>2</sub> e
Program Area	Performance Measures and Data								
							12/2013		
	<b>Additional Information:</b> Starting with FY 2012, new program tools allow closer alignment with FY cycle and cumulative approach. These tools use real data so variances between modeled projections and actuals are to be expected. Synchronism applied to prior years. The baseline in 2004 is 0.7 million metric tons of carbon dioxide equivalent reductions from the SmartWay program. To serve as a basis for comparison in future years, EPA projected from the 2004 baseline into the future assuming no impact on greenhouse gas emissions from U.S. climate change programs. The baseline was developed as part of an interagency evaluation of the U.S. climate change program in 2002, which built on similar baseline forecasts developed in 1993 and 1997 in the U.S. Climate Change Action Report (2002). Baseline data for carbon emissions related to energy use is based on data from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO <sub>2</sub> ) emissions, including nitrous oxide and other high global warming potential gases are maintained by EPA.								
	<b>(PM G16) Million metric tons of carbon equivalent (MMTCO<sub>2</sub>e) of greenhouse gas reductions in the industry sector.</b>								
	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Unit
	Target	229.6	248.3	267.3	304.0	346.2	372.9	421.9	441.8
	Actual	267.3	289.7	293.7	362.8	386.4	Data Avail 12/2013		MMTCO <sub>2</sub> e
	<b>Additional Information:</b> The baseline in 2004 is 201 million metric tons of carbon dioxide equivalent reductions from ENERGY STAR for the Industrial Sector, Non-CO <sub>2</sub> Partnership Programs, Combined Heat and Power Partnership, Significant New Alternatives Policy (SNAP), and the Landfill Rule. To serve as a basis for comparison in future years, EPA projected from the 2004 baseline into the future assuming no impact on greenhouse gas emissions from U.S. climate change programs. The baseline was developed as part of an interagency evaluation of the U.S. climate change program in 2002, which built on similar baseline forecasts developed in 1993 and 1997 in the U.S. Climate Change Action Report (2002). Baseline data is based on data from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO <sub>2</sub> ) emissions, including nitrous oxide and other high global warming potential gases are maintained by EPA.								

**The Honorable John D. Dingell**

1. Does the EPA see a future for coal as a viable source in light of the impending greenhouse gas regulations?



**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

A. Yes, according to the U.S. Energy Information Administration (EIA), about 37% of U.S. electricity generation is from sources using coal and we expect coal to remain a vital fuel for power production in the future.

**2. I understand that there will be a different proposal for modified sources (units that have been updated) and for existing sources (that have not been modified).**

**a. Can you tell me if EPA is reaching out to all stakeholders concerned about both components of the greenhouse gas rule?**

A. In September, the EPA proposed new source performance standards for emissions of greenhouse gases from new fossil fuel-fired plants. These proposed standards are practical, flexible, and achievable and ensure that power companies investing in new fossil fuel-fired power plants will use modern technologies that limit emissions of harmful carbon pollution. The EPA will finalize these standards in a timely manner, after considering public comments on the proposal. The EPA will accept written comments on the proposal until May 9, 2014.

As we consider guidelines for existing power plants, the EPA is engaged in vigorous and unprecedented outreach with the public and with key stakeholders as well as with the states. The eleven listening sessions the EPA held throughout the country were attended by thousands of people, representing many states and a broad range of stakeholders, including many from the coal industry. In addition, we have been meeting with industry leaders and CEOs from the coal, oil, and natural gas sectors; state, tribal, and local government officials from every region of the country; and environmental and public health groups, faith groups, labor groups, and others. Our meetings with state governments have encompassed leadership and staff from state environment departments, state energy departments and state public utility commissions.

**3. The debate about climate change is not just about air, but also water. You may know that the Great Lakes contain 20 percent of the world's fresh water. Luckily, water levels are up slightly this year after years of inadequate ice cover on the Lakes and too little rain and snow. Lower lake levels affect not only shipping and boating recreation but also make it easier for algae blooms to form, endanger fishery habitats, and threaten drinking water sources as well as cooling water intakes. -**

**In dealing with water quality, do you believe EPA has adequate clarification of its jurisdiction under the Clean Water Act to ensure protection of water sources?**

A. The EPA shares the concern being raised by many that Supreme Court decisions have resulted in confusion about the geographic scope of waters protected by the Clean Water Act. Since 1972, the Clean Water Act has protected our health and environment by reducing the pollution in streams, lakes, rivers, wetlands and other waterways. But over the past decade, interpretations of Supreme Court rulings have removed some waters from federal protection, and caused confusion about which waters and wetlands remain protected. To provide greater consistency, certainty,

**Answers to Questions Submitted by the House Committee on Energy and Commerce  
Concerning Climate Change, Adaptation and Sustainability**

and predictability nationwide, the EPA and the U.S. Army Corps of Engineers are working to develop a proposed rule to clarify where the Clean Water Act applies.

4. **You may have seen a recent map published in National Geographic showing what would happen if all of the world's ice were to melt. While this is a somewhat drastic scenario that shows almost all of Florida and New Jersey submerged, it was what was not on the map that intrigued me the most. The map showed little or no effect on the Great Lakes. Do you believe that EPA, along with other federal agencies, have the tools necessary to predict what effects climate change might have on the Great Lakes region?**

A. The EPA believes that, together with its state and federal partners – especially the National Oceanic and Atmospheric Administration – we have the basic tools necessary to project climate change effects on the Great Lakes, particularly on a large scale. Federal funding, including some Great Lakes Restoration Initiative funding, has been enabling improved downscaling of Regional Climate Model scenarios to a scale more useful to resource managers across the Great Lakes region. Uncertainties remain, and continued refinement is necessary as more impacts, such as the potential expansion and contraction of ranges for native and invasive species, become evident, but that should not be a reason for not acting on the information we do have.

## Climate Change Funding

[illegible]

\* The climate change chart was restructured in 2011 and the programs were not detailed in the same way prior to that time. The resources reported on the "Other Programs" line for FY 2005-2009 are the total for the voluntary programs for Climate Change. The "Other Programs" line for FY 2010-2009 are the total for the voluntary programs for Climate Change.